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What is BIM and how to Impeliment BIM in any project

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Universal Collage of Engineering

Abstract

BIM was initially advocated as a worldwide idea in the 1970s, but the term 'Building Information Modeling' was not used until the 2000s. BIM software was launched by companies like Autodesk, which are still major participants today. But in the current digitalera, it is making its way to the future of the AEC industry. The design communication is gradually being changed from 2D based to integrated 3D digital interface. Building Information Modeling (BIM) is a model-based design concept, in which buildings will be built virtually before they get built out in the field, where data models organized for complete integration of all relevant factors in the building lifecycle which also manages the information exchange between the AEC (Architects, Engineers, Contractors)professionals,to strengthen the interaction between the design team. BIM is a shared knowledge aboutthe information for decisions making during its lifecycle. Building information modeling (BIM) is transforming the way of work across the architecture, engineering, and construction industry, where BIM offers vast opportunities for improving performance.

BIM can assist a more sustainable construction process that in turn may contribute to eradicating poverty in developing countries like India. While BIM is increasingly being adopted in developed countries, implementations in the developing country context are rare. Discussions demonstrate that research on BIM applications for structural engineeringhas been constantly growing with a sudden increase after 2014.This study reveals that research attempts on this area have been dominated by exploring generic issues of BIM like information management; however, technical issues of structural engineering, to be resolved through BIM capabilities, have remained overlooked. BIM work-sharing in Indiahas become the 1st choice for overseas based companies like: General Contractors, DesignConsultants, Architects and Developers.

CHAPTER 1

Introduction

Building Information Modeling (BIM) is the documentation process consisting of informationabout different phases of any project like design, construction planning, construction, facility management and operation. Construction projects in India have been growing rapidly. The India construction market size was $609.6 billion in 2021. The market is projected to grow at an AAGR of more than 6% during the period 2023 to 2026. Growth in the forecast period willbe supported by a strong pipeline of infrastructure projects across various sectors. The projectowner is usually more focus on budget overrun than time delay because direct effect of a delayed project is less obvious. However, in an infrastructure project consequence of a delayedproject is not only directly affecting the project cost, but the area of a construction site is also severely affected. In a major city, traffic congestion increase in the affected area eventually leads to huge economic loss. Building information modeling (BIM) has been widely known forhaving many benefits for the construction industry. Improvement of project cost control and conflict reduction are among the benefits associated with BIM. Therefore, BIM has been widely adopted in many countries to Availability of computers opened scopes for creating a data model for a complete design process starting from conceptual phase to the operational phase.

1.1 What Is BIM?

BIM is an acronym for Building Information Modeling or Building Information Management.It is a highly collaborative process that allows architects, engineers, real estate developers, contractors, manufacturers, and other construction professionals to plan, design, and constructa structure or building within one 3D model.

Building information modeling (BIM) is a process supported by various tools, technologies and contracts involving the generation and management of digital representations of physical and functional characteristics of places. Building information models (BIMs) are computer files (often but not always in proprietary formats and containing proprietary data) which can be extracted, exchanged or networked to support decision-making regarding a built asset. BIM software is used by individuals, businesses and government agencies who plan, design, construct, operate and maintain buildings and diverse physical infrastructures, such as water, refuse, electricity, gas, communication utilities, roads, railways, bridges, ports and tunnels.

1.2 What is Level of Development (LOD)?

Level of Development (LOD) specification allows professionals in the industry to articulatehow an element's geometry and associated information has evolved throughout the entire process. It signifies the degree to which different members of the team can rely on information associated with an element.

The LOD specification helps designers define the inherent characteristics of the elements in a model at different stages of development. The clarity in illustration gives depth to a model, signifying how much and at which level someone should rely on a model's element.

1.2.1 Fundamental Definitions Associated with LOD

1.2.1.1 LOD 100 - Conceptual

The Model Element may be graphically represented in the Model with a symbol or other generic representation. Information related to the Model Element can be derived from other Model Elements. Any information derived from LOD 100 elements must be considered approximate.

1.2.1.2 LOD 200 - Approximate Geometry

The Model Element is graphically represented within the Model as a generic system, object, orassembly with approximate quantities, size, shape, location, and orientation. Any informationderived from LOD 200 elements must be considered approximate.

1.2.1.3 LOD 300 - Precise Geometry

The Model Element is graphically represented within the Model as a specific system, object orassembly in terms of quantity, size, shape, location, and orientation. Non-graphic informationmay also be attached to the Model Element. The project origin is defined and the element is located accurately with respect to the project origin. LOD 350 - Precise Geometry with Connections

LOD 350 the Model Element is graphically represented within the Model as a specific system,object, or assembly in terms of quantity, size, shape, location, orientation, and interfaces with other building systems. Non-graphic information may also be attached to the Model Element.

1.2.1.4 LOD 400- Fabrication-ready Geometry

LOD 400 the Model Element is graphically represented within the Model as a specific system,object or assembly in terms of size, shape, location, quantity, and orientation with detailing, fabrication, assembly, and installation information. Non-graphic information may also be attached to the Model Element.

1.2.1.5 LOD 500 - Operational/As-built Models

LOD 500 the Model Element is a field verified representation in terms of size, shape, location,quantity, and orientation. Non-graphic information may also be attached to the Model Elements.

1.3 The Benefit of Clarity Due to LOD for an AEC Project

Level of development is an extremely important element of the entire BIM process. Without LOD, it can become hard for everyone to work on the same page, creating inconsistencies thatcan hamper a

Project's prospects. With the help of LOD specifications, communication and collaboration can become easier and faster, making room for efficient deployment of resources at all levels of design and construction. Here are some of the benefits of the level of developmentspecifications in the design process:

1.3.1 Better collaboration and communication between different teams

With the help of standardized specifications and detailed information about all the elements, designers can provide guidelines and data for people working downstream to ensure zero lapsesin execution and maintenance. LOD makes it easier to define a standard for contractors who must take care of BIM execution. At the same time, design managers can explain therequirements at various levels of the design process to the teams in a better way.

1.3.2 Articulated Scope associated with a BIM deliverable.

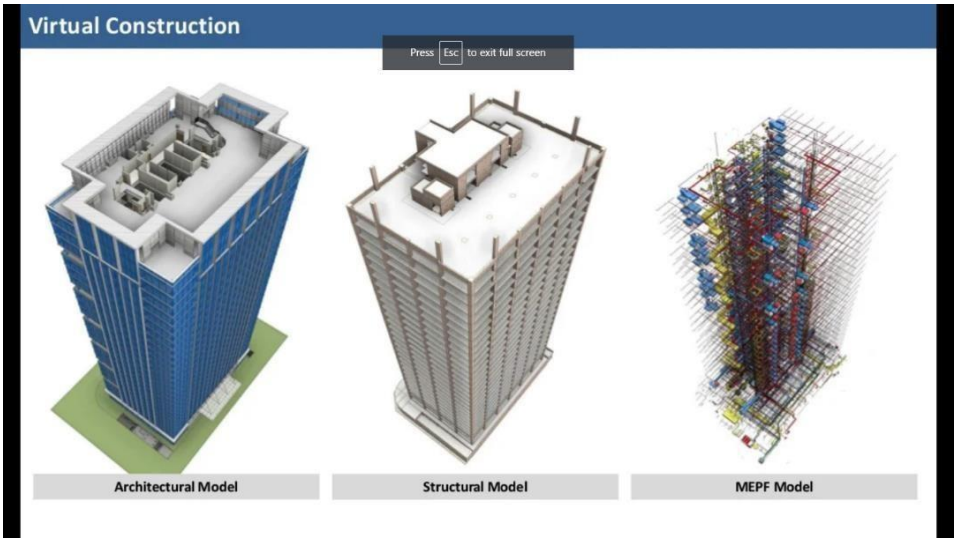
With the help of LOD, BIM models become more accurate. At the same time, all the teamsincluding the owners can precisely specify the level of detail they want from a BIM model andget clarity on the scope of the final BIM deliverable. Importance of LOD in an AEC Project In an era where everything is handled digitally and all critical projects make use of a 3D model,it becomes hard for designers to make other teams understand the project expectations. Mostoften, handling a BIM model comes with a unique challenge- different people perceivedifferent definitions of completion.

LOD creates a standardized definition of what completion means and eliminates chances of discrepancies associated with project completion. Using LOD, teams working under different disciplines can communicate with each other in a better way with greater clarity. LOD enhancesclarity in design by making use of advanced techniques and technology.

1.4 BIM Objects

BIM objects, the components that make up a BIM model, are intelligent, have geometry, and store data. If any element is changed, BIM software updates the model to reflect that change. This allows the model to remain consistent and coordinated throughout the entire process so that structural engineers, architects, MEP engineers, designers, project managers, and contractors can work in a more collaborative environment. In the past, blueprints and drawingswere used to express information about a particular building plan.

This 2D approach made it very difficult to visualize dimensions and requirements. Next cameCAD (Computer Aided Design), which helped drafters see the benefit of plans in a digital environment. Later on, CAD turned 3D, which brought more realistic visuals to blueprints. Now, BIM (Building Information Modeling) is the standard— but it is much more than just a



1.4.1 The "I" in BIM

BIM, as a whole, refers to the process of all parties involved in the construction and lifecycle management of built assets, working collaboratively and sharing data. However, the true power of BIM lives in the "I" (information). All of the information gathered— from conception to completion— isn't just stored, it's actionable.

1.4.2 How Is BIM Information Shared?

This information in a BIM model is shared through a mutually accessible online space knownas a common data environment (CDE), and the data collected is referred to as an 'informationmodel'. Information models can be used at all stages of a building's life; from inception to operation— and even renovations and renewals.

1.5 What are the dimensions of BIM?

BIM doesn't simply mean the creation of the 3D model of a building. It also implies adding information relating to its design, construction and maintenance phases.

BIM dimensions – 3D, 4D, 5D and 6D and even 7D, enhance the data associated with the model to

Share a greater level of understanding of the construction project. Adding extra information todata, in fact, enables you to find out how the project will be delivered, what it will cost and how it should be maintained.

1.5.1 3D BIM is just a geometry modelling matter

Using cutting-edge tools for reproducing construction digital models allows us to take care of the graphic detail of our design, while guaranteeing a realistic rendering of the aesthetic appearance and excellent geometric adherence of the modelled elements. Problem that can be solved during the planning stage don't just concern the model rendering as such, being separated from the technical disciplines involved, but it also contemplates the interaction ofseveral roles involved/disciplines as a key component of this methodology. Activity management need, known as "model checking", can be expressed with two separate operations:

- Code checking, the verification of the model adherence to the project andto standardsRequirements.
- Clash detection, the preventive analysis of the possible geometric conflicts presentin the model.

1.5.2 4D BIM: The time dimension to manage work schedules.

4D BIM adds an extra dimension to a project describing task duration and timing in order to drive a 3D representation of how the building evolves in relation to the various construction phases. Time management represents a fundamental aspect in construction planning. Some ofthe traditional Methods employed in this sector (such as Gantt and Pert charts) for the construction site or project time management have certain limits and critical issues:

- Data loss from designer to the construction company.
- Lack of communication between works management and suppliers.
- The effective presence and precise placement of materials on the construction site.
- The progress of work.

1.5.3 5D BIM: quantity and cost estimate. A new strategy or a traditional approach?

The focal point of 5D BIM is the "Quantity Take Off", which consists in the measurements extraction from a project to define the material/s quantity necessary for one or more elements modelling. Once this operation has been completed, it is necessary to choose the price items tobe assigned to the construction works, with the relative unit price, and then determining the amount. Consequently, you can monitor the choices made by the quantity surveyor and verifyif they match with the designer's ones. Typically, the cost estimate updates in parallel with howthe project design evolves, with the risk of data loss during the updating process (the probabilityis quite high!). By making a comparison between the cost estimate and 4D BIM, we can assesswhether the result should be a static or dynamic product. The outcome can be linked to some aspects, such as maintenance, which are interconnected but treated separately. Therefore, it is clear how the processes reconsideration, interaction and tools can streamline the information management, linking this last dimension to other aspects of the " building life cycle".

1.5.4 6D BIM: sustainability and energy efficiency

The sixth dimension concept is associated with aspects related to energy efficiency and the sustainable development of a new or already existing building. 6D BIM simulation practicallyallows an exhaustive analysis in terms of (economic, environmental, energy, etc.) sustainability of the intervention. Analyzing the energy performance right from the design stage provides thedesigner the most suitable technical solutions to be adopted to ensure lower energy consumption, greater quality and comfort thus guaranteeing the sustainability of the project.

1.5.5 7D BIM: the maintenance phase

One of the objectives of the BIM methodology is to create a virtual (three-dimensional and informative) model more faithful to what has actually been achieved. A model defined "As- built" includes, indeed, not only what has been designed, but also what is being built during the construction phase. What is conceived during project phase, is traditionally reviewed and modified on the construction site to cope with possible variations during the construction building or for resolving geometric or operational conflicts not taken into account in the initial building stage. This model is not to be intended as a model produced by a single "BIM authoring" software but as a product from a set of models made with a software and able to describe the construction work in an appropriate manner compared to the appropriate level of digital development required (LOD here intended as " Level of Development.

1.6.1 Aim of the study

To Design and Plan Building of G+14 including basement with using BIM.

1.6.2 Objective of study

1.To Design a BIM (Building Information Model) Model of G+14 with a basement

2.To Build a BIM model with LOD (level of development) 350

3.To analyses cost of construction using BIM model.

4.To analyses Time of construction using BIM Model.

5.To find any clashes avoid before construction.

6.To plan and manage project using different management techniques.

CHAPTER 2

2.1 Revit

Methodology

Autodesk Revit is a building information modelling software tool for architects, landscape architects, structural engineers, mechanical, electrical, and plumbing (MEP) engineers, designers and contractors. The original software was developed by Charles River Software, founded in 1997, renamed Revit Technology Corporation in 2000, and acquired by Autodesk in 2002. The software allows users to design a building and structure and its components in 3D, annotate the model with 2D drafting elements, and access building information from the building model's database. Revit is 4D building information modeling capable with tools to plan and track various stages in the building's lifecycle, from concept to construction and latermaintenance and/or demolition. Autodesk Revit is a building information modelling software tool for architects, landscape architects, structural engineers, mechanical, electrical, and plumbing (MEP) engineers, designers and contractors. The original software was developed by Charles River Software, founded in 1997, renamed Revit Technology Corporation in 2000,and acquired by Autodesk in 2002. The software allows users to design a building and structureand its components in 3D, annotate the model with 2D drafting elements, and access building information from the building model's database. Revit is 4D building information modeling capable with tools to plan and track various stages in the building's lifecycle, from concept to construction and later maintenance and/or demolition.

Fig; 2.1 img of Revit Software

BIM EXECUTION PLAN

Skyline Developers Pvt. Ltd – Vrajdham

SECTION 1: INTRODUCTION:

The purpose of this document is to record the agreed strategies and process for the whole teamworking on this BIM project. It is to serve as a reference and record of the collaborative processthroughout the life of the project and it is expected to evolve from the start to the end of the BIM process.

BIM is more than a set of digitally build models, but a mind-set and process which is at the origin of an integrated

project team.

This document is addressing project workflows, model creation, model authors and model ownership & cross project data sharing.

This document shall support communication among the different teams, obliged to adapt this BIM strategy; otherwise, potential efficiencies will be lost.

The BEP shall be updated and amended at each major project phase deliverable, if new key parties or entities are brought on board the project and incorporated into the BIM Execution Plan.

This plan delineates roles and responsibilities of each party at each phase, the scope and level of detail of information to be developed, data to be managed, shared, processes defined and software to be utilized.

A: PROJECT INFORMATION AND DESCRIPTION

This section includes the general project information, a brief description of the project.

Client:	Skyline Developers Pvt. Ltd
Project Name:	Vrajdham
Project Number:	1
Project Location:	KANDIVALI, Mumbai

B: SCOPE OF WORK

BIM OBJECTIVES:

Scope of work is to create an accurate and information rich BIM (Revit) model of the Architectural, Structural, Mechanical, Electrical, Plumbing, Fire protection services, Sitemodels. BIM models shall be created using the design drawings by respective ASMEP consultants. Revit models developed will be utilized for specific purposes as listed below:

- 3D: visualize Structure, Architecture & MEP systems.
- Detect and report clashes between inter-discipline services systems.
- Resolve clashes collaboratively with the ASMEP consultants.
- 3D Booklet

BIM USES:

The BIM uses lists the objectives of the BIM models.

BIM UseCases	Author	Users
Detailed Design Description: Models contain detailed version of generalized building components and systems with accuratedimensions, shape, location, orientation and quantity. Non-geometric properties should be provided.		
Activity: Update & maintain the DD level Architectural Model including Site modelwith roads, boundary walls with coordination input from structural and MEP consultants. - Modification of Ceiling-based MEP Component with defined levels and locations.Expected Deliverable • LOD 300 Architectural Model • Quantity Take-off (QTO) sheets	Architecturalconsultant	SDPL SVEPL team,SMEP consultants
Activity: Update & maintain the DD level Structural Model - Expected Deliverable • LOD 300 Structural Model • Quantity Take-off (QTO) sheets	Structural consultant	SDPL SVEPL team, AMEP consultants
Activity: Update & maintain and the MEP Model, based on the latestArchitectural andstructure model. -Expected Deliverable • LOD 300 MEP Model • Quantity Take-off (QTO) sheets	MEP consultant	SDPL SVEPL team,AS consultants
Activity: Audit the basic hygiene of models received from design consultants Implement clash coordination between the Architectural, Structural MEP andlandscape models. - Expected Deliverables • Audit report • Clash Detection and Resolution Report	SVEPL team	SDPL, ASMEP consultants
Activity: Resolve clashes between the Architectural, Structural, MEPand Landscapemodels and update the respective 3D BIM models - Expected Deliverables • Updated clash free LOD 300 models	ASMEP, consultants	SDPL, SVEPL team
Activity: Produce detailed estimation and Bill of Quantities based on BIM models. - Expected Deliverables • Detailed Quantities	ASMEP consultants	SDPL
Activity: Extraction of drawings from ASMEPF BIM Model.Expected Deliverable: 2D drawings of DD set extracted from clash free model.	ASMEP consultants,	SDPL
GFC Stage: Description: BIM element is modelled with fabrication and assembly details where applicable or useful for construction works; otherwise, details may be represented in 2D CAD drawings to complement theDetailed Design models		

Activity: Further update LOD 300 level model based on coordination inputto generateGFC drawings - Modification of Ceiling-based MEP Component with defined levels and locations.Expected Deliverable- • Updated clash free LOD 300 ASMEP Models • Quantity Take-off (QTO) sheets (Refer Annexure)	ASMEP consultants	SDPL ,SVEPL team,
Activity: Implement clash coordination between the Architectural, Structural MEP andlandscape Models - Expected Deliverables • Audit report • Clash Detection and Resolution Report	SVEPL team	SDPL, ASMEP consultants.
Activity: Resolve clashes between the Architectural and structural, MEP models andupdate the respective 3D BIM models - Expected Deliverables • Final clash free LOD 300 models	ASMEP consultants,	SDPL ,SVEPL team
Activity: Produce detailed estimation and Bill of Quantities based on BIM models. - Expected Deliverables • Detailed Quantities	ASMEP consultants,	SDPL team
Activity: Extraction of drawingsfrom BIM Model.Expected Deliverable: • 2D ASMEPF drawings of GFC set extracted from clash free model.	ASMEP consultants,	SDPL
Activity: BIM booklet -Expected Deliverables • As per MLDL sample format, BIM Booklet with Exterior shadedimages Interiorimages	SVEPL team	SDPL team

C: PROJECT SCHEDULE

PROJECT PHASES/MILESTONES	OUTPUT	ESTIMATED DELIVERYDATES	RESPONSIBILTY
1. DD STAGE			
LOD 300 BIM MODELS -			
A. STRUCTURAL BIM MODELS	REVIT FILES	As per mutually decided project schedule timelines	SV Enterprise
B. ARCHITECTURAL BIM MODELS	REVIT FILES		SV Enterprise
C. MEPF BIM MODELS	REVIT FILES		Parmar Enterprise
D. AUDIT CLASH/OBSERVATION REPORT -01	EXCEL/HTML /PDFREPORTS		SV Enterprise
E. 2D ASMEP + LANDSCAPEDRAWINGS-DD SET -01	ACAD & PDFFILES	As per mutually decided project schedule timelines	ASMEP Consultants
F. 1st SET OF QTY REPORT -01	EXCEL FILES	As per mutually decided project schedule timelines	ASMEP Consultants
2. GFC STAGE			
LOD 300/350 BIM MODELS			

G. UPDATED ARCHITECTURAL BIM MODELS	REVIT FILES	As per mutually decided project schedule timelines	SV Enterprise
H. UPDATED STRUCTURAL BIM MODELS	REVIT FILES		SV Enterprise
I. MEPF BIM MODELS	REVIT FILES		Parmar Enterprise
J. AUDIT CLASH/OBSERVATION REPORT -02	EXCEL/HTML /PDFREPORTS		SV Enterprise
K. 2D ASMEP + LANDSCAPEDRAWINGS – GFC SET-01	ACAD & PDFFILES	As per mutually decided project schedule timelines	ASMEP Consultants
L. 2nd SET OF QTY REPORT -02	EXCEL FILES	As per mutually decided project schedule timelines	ASMEP Consultants

D: PROJECT TEAM

The following roles should be defined, agreed and maintained for each stage of a project. Thissection defines the Core Collaboration Team for this project.

ROLES	RESPONSIBILITIES
DESIGN CONSULTANTS (ARCHITECTURE, STRUCTURE,MEP, LANDSCAPE, EXTERNAL DEVELOPMENT)	- Providing timely inter-disciplinary input for modelling during different designphases - Providing correct datum model of towers to the structural consultant within aweek of project BIM kick-off (applicable only to architecturalconsultants) - Preparing LOD 200/300/350/400 BIM models as applicable, in linewith theshared MLDL BIM standards and BEP - Preparing quantity take off (QTO) sheets - Resolving the clashes and updating the respective models - Extracting the 2D drawings from clash free 3D model at SD, DD and GFC stages,as per SDPL standard formats/templates
BIM LEAD COORDINATOR(BIM MANAGER- MLDL)	- Sharing the standard BIM scope for the appointment of external BIM consultant - Setting up BIM common data environment for the project, including accessrights - Arranging for the BIM kick-off meeting with all consultants, disciplinecoordinators and external BIM agency

ORGANISATION	ROLE/ DEPARTMENT	RESPONSIBILITY	CONCERNED PERSON	EMAIL	PHONE NO
Skyline Developers pvt. Ltd–HO /RO / SO	LEAD COORDINATOR	BIM COORDINATION	Shubh Vyas	Shubh02bim@gmail.com	+919999999999
	PROJECT COORDINATOR	ARCHITECTURAL COORDINATION	Shubh Vyas	Shubh02bim@gmail.com	+91 9999999999
	STRUCTURAL COORDINATOR	STRUCTURAL COORDINATION	Shubh Vyas	Shubh02bim@gmail.com	+91 9999999 999
			Darshan Rampariya	darshan02@gmail.com	+91 7777777777
	MEPF COORDINATOR	MEPF COORDINATION	Vatsal Parmar	vatsal02bim@gmail.com	+91 8888888888
SV Enterprise	BIM OPERATIONS	OPERATIONS	Shubh Vyas	Shubh02bim@gmail.com	+919999999999

	BIM PROJECT COORDINATOR	PROJECT COORDINATION	Shubh Vyas	Shubh02bim@gmail.com	+919999999999
SV Enterprise	ARCHITECTURAL DESIGN	Senior Associate	Shubh Vyas	Shubh02bim@gmail.com	+919999999999
	ARCHITECTURAL DESIGN	Associate	Shubh Vyas	Shubh02bim@gmail.com	+919999999999
	ARCHITECTURAL DESIGN	Project Architect	Shubh Vyas	Shubh02bim@gmail.com	+919999999999
	ARCHITECTURAL DESIGN	BIM Architect	Shubh Vyas	Shubh02bim@gmail.com	+919999999999
SV Enterprise	STRUCTURAL DESIGN	Project Manager	Shubh Vyas	Shubh02bim@gmail.com	+919999999999
	STRUCTURAL DESIGN	BIM Modellor	Shubh Vyas	Shubh02bim@gmail.com	+919999999999
	STRUCTURAL DESIGN	S Senior Design Engineer	Shubh Vyas	Shubh02bim@gmail.com	+919999999999
	STRUCTURAL DESIGN	Design Engineer	Shubh Vyas	Shubh02bim@gmail.com	+919999999999
Parmar Enterprise Limited	MEPF DESIGN	MEPF DESIGN & DRAWINGS	Vatsal Parmar	vatsal02bim@gmail.com	+91 8888888888
Darshan Enterprise	MEPF DESIGN	MEPF DESIGN & DRAWINGS	Darshan Rampariya	darshan02@gmail.com	+91 7777777777

SECTION 2: BIM REQUIREMENTS

This section lists the BIM uses for the project and the party, or parties, responsible for completing that use and any output defined for that use.

A: SOFTWARE PLATFORM

New versions of Modelling software are released each year. These are not normally backwardscompatible and so it must be agreed, at the start of any new project, that the latest version of the software, compatible for all parties, is used to take advantage of product efficiencies etc.

Once a model is started in one version, it is imperative that it is not upgraded to a newer version, unless (and following discussions among all parties) by the express written agreementand sanctioned by the project team members.

B: SOFTWARE LICENSING

MLDL, Design Consultants and External BIM consultant should have acquired their own software licenses. MLDL shall not provide any license for working. Every consultant shall manage their own licenses for working.

C: BIM MEETINGS:

At the earliest opportunity in the project lifecycle, it is important that the project team hold aninitial BIM meeting. This meeting should introduce the concept behind this document and determine the collaboration on the BIM platform for the duration of the project.

The Project team should meet regularly throughout the project to review the BIM. It is suggested that these meetings are held separately to the main design team meetings and attendance should be by the persons identified as Lead Coordinator.

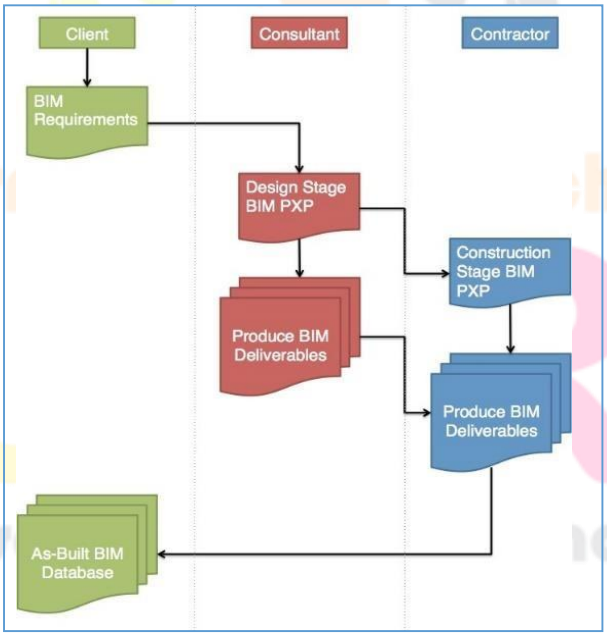
The sole purpose of these meetings shall be for the review of the BIM and the processes contributing to it. Subsequently, this document shall be updated and re-distributed to the team.

Frequency of model sharing	Sharing platform	Frequency of BIM clash reports
Every Week - Friday EOD	TBD	Every week - Tuesday EOD

D: Model sharing Frequency:

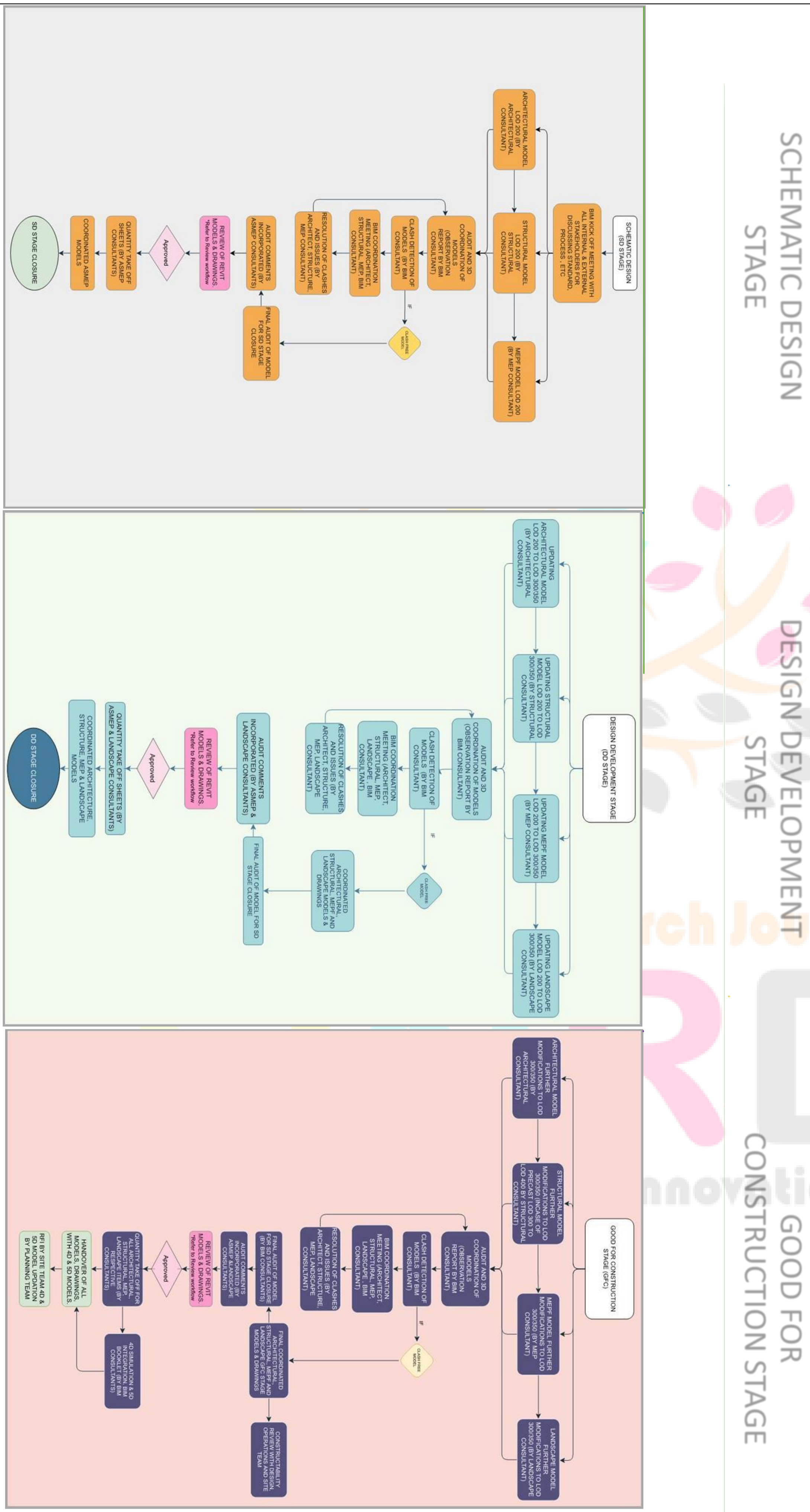
SECTION 3: BIM STANDARDS

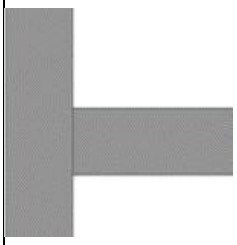
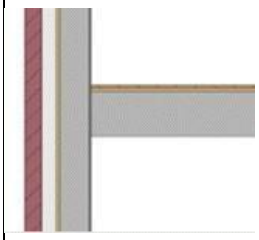
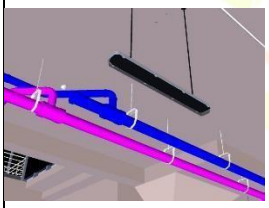
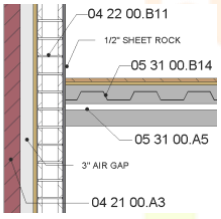
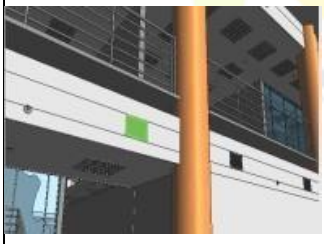
The basic guideline of "BS EN ISO 19650-1, BS EN ISO 19650-2" standard which shall serveas the minimum requirements for this project. Any activity listed in BEP and reference for thesame not found in ISO 19650, AEC-UK BIM standards may be referred as an additional resource.



➢ BS EN ISO 19650-1: Organization and digitization of information about buildings andcivil engineering works, including building information modelling -- Information management using building information modelling: Concepts and principles.

➢ BS EN ISO 19650-2: Organization and digitization of information about buildings andcivil engineering works, including building information modelling -- Information management using building information modelling: Delivery phase of the assets.


SCHEMATIC DESIGN STAGE
DESIGN DEVELOPMENT STAGE
GOOD FOR CONSTRUCTION STAGE

Indicative Example	LOD	Definition
	LOD 200 (Schematic Level)	Models include elements in which masses have been replaced with Generic Components. Analysis based onOverall Systems can be performed. Quantities based onspecific Elements can be obtained.
	LOD300 (Tender/DD Level)	Models include elements in which Generic Components have been replaced with fully defined Assemblies. Analysisbased on Specific Systems can be performed. Quantities based on Materials can be obtained. At this level, the modelmay also have non-geometric (3D) information such as text,dimensions, notes, 2D details etc. (Note: Architectural & Structural Model shall be built to a Maximum of LOD 300 Level in this Project)
	LOD 350 (Detailed GFCLevel)	Models include elements in which Generic Components have been replaced with fully defined Assemblies and necessary supporting/installation intents. These are mostly detailed GFCs provided by the Consultants At this level, themodel may also have non-geometric (3D) information such as text, dimensions, notes, 2D details etc. (Note: MEPF Model shall be built to a Maximum of LOD 350Level in this Project)
	LOD 400 (Fabrication Level)	Level 400 Models include elements that are accurate in termsof size, shape, location, quantity, and orientation with complete fabrication, assembly and detailing information. Atthis level, the model may also have non-geometric (3D) information such as text, dimensions, notes, 2D details etc. These are mostly prepared by the Trade Contractors.
	LOD 500 (As-BuiltLevel)	Models include elements modelled as constructed. Elements are modelled to accurate size, shape, location and orientation. Non-geometric or physical attributes are included as parameters to the geometric shape. At this level,model granularity is similar to LOD 400 with the exceptions that elements are as-constructed. At LOD 500, the model is capable of being utilized for operations and maintenance.

ARCHITECTURE COMPONENTS –	**STRUCTURAL COMPONENTS –**
➢Casework ➢Ceilings ➢Columns [Arch non-analyticalcolumns] ➢Curtain walls and panels ➢Detail Components ➢Doors ➢Entourage ➢Floors ➢Furniture ➢Generic Models ➢Planting ➢Profiles ➢Families ➢Roofs ➢Site and Site Components ➢Specialty Equipment ➢Arch Stairs and Railings ➢Balusters ➢Windows ➢Sanitary Fixtures ➢Electrical Fixtures (Switch board,Wall &Ceiling light, Fan etc.) ➢Shaft ➢Architectural Finishes etc…	➢Columns ➢Connections ➢RCC Slabs ➢Foundations and PCC ➢RCC Framing/Beams ➢RCC Generic Models ➢Retaining Walls ➢Structural Walls ➢RCC Stairs ➢Nonstructural Walls ➢RCC Ramps etc. ➢Shaft & Wall sleeves(to be copy/monitored from MEPFmodel) ➢Cut-outs
PLUMBING -	**FIRE FIGHTING -**
➢Domestic cold-water pipe & pipefittings ➢Flushing cold-water pipe & pipefittings ➢Solar hot water pipe & pipe fittings ➢Hot water pipe & pipe fittings ➢Irrigation water pipe & pipe fittings ➢Solar water heater system ➢Ball valves ➢Butterfly valve ➢Non-return valve ➢Pressure relief valve ➢Y-strainer ➢Pumps ➢Pump assembly ➢G.I./PVC sleeves ➢Retaining wall/ugt wall sleeves ➢Water meter chamber ➢Water meter ➢Soil water pipe & pipe fittings ➢Waste water pipe & pipe fittings ➢Round gratings & multi traps ➢Soil & waste water downtake pipe& pipefittings ➢Vent pipe, Vent cowl & pipe fitting ➢Plumbing fixtures (washbasin, waterclosetwall hung, shower	➢Fire Fighting Hydrant System ➢Fire Fighting Sprinkler System ➢Fire Protection Equipment ➢All Fittings ➢BMS System and Equipment's etc… ➢Wall sleeves ➢Cut-outs ➢Sprinklers

diverter/mixer, kitchen sink, electricwater heater, tap, health faucet etc.) ➢External sewer drainage pipe& pipefittings ➢Gully trap ➢Inspection chamber (rectangular &circular) ➢Sump pit along with sump pump ➢Sewage treatment plant (STP) ➢STP to municipal sewer drainagesystem ➢Water treatment plant (WTP) ➢Underground water tank & PumpRoom ➢Rainwater downtake pipe & pipefittings ➢Balcony drain pipe & pipe fittings ➢Scupper type drain ➢Catchbasin ➢Storm water drain channel ➢Storm water channel grating ➢Recharge Pits ➢Storm water drain connection to Externalstorm water drain system ➢Cut-outs	
ELECTRICAL -	
➢Electrical conduits ➢Lighting Fixtures and Devices ➢Electrical Fixtures (Distribution Board,meter room, ELV box etc.) ➢Electrical Socket and switches etc…(to becopy monitored fromArch Model) ➢Cable tray and its fittings ➢Conduits ➢Lightning Protection System (LightningArrester, G.I. Strip, Down Conductor, Earth Test Link,Earth Termination Linketc.) ➢Earthing System (Earthing Wire,Earthing G.I. Strip, Earth Electrode, G.I./CopperEarthing Pit etc.) ➢D.G. Set System (D.G. Set, AMF Panel, D.G. Panel, SLFP etc.)	

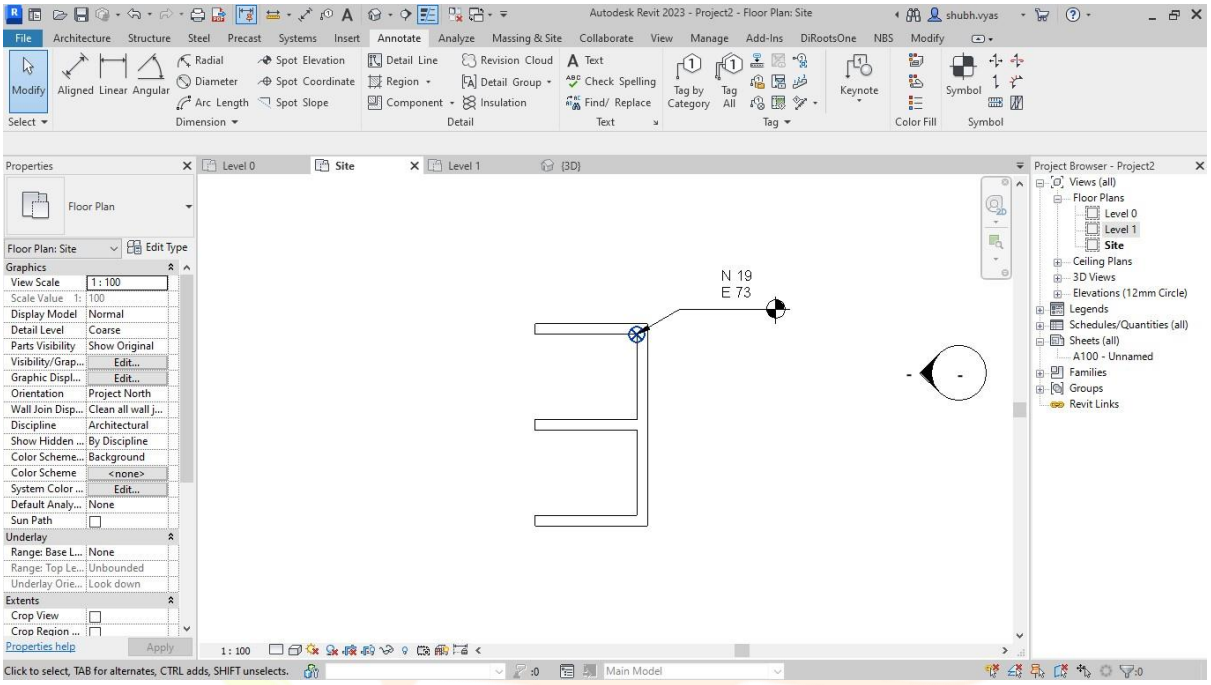
D: PROJECT COORDINATES

The project's Shared Coordinate System "URS" (Unique Reference System) shall be agreed upon by all parties prior to start of the project. The architectural base model shall serve as basisfor the entire BIM model. The BIM project shall adopt the established Project SharedCoordinate system across all BIM data file to allow them to be referenced without modification.

However, all the respective consultants shall refer site plans and building models to Revit internal project coordinate system. The Project Base Point shall be located within the project.

The agreed Project Base Point is:

Building	Location	North	East	Angle
A	Passenger lift corner	19.2	73	15.00



E: SHARED COORDINATE SYSTEM

Architect shall be responsible for creating a shared coordinate system. This shared coordinationsystem shall be then followed by other consultants been established (usually through survey), it shall be used to establish the project shared coordinates in a shared site file. This shall then be distributed to the team to create their proper respective shared coordinate systems.

G: FILE STRUCTURE

All files shall follow the file naming convention as described below:

DEFINITION	CODE FORMAT	DETAILS
PROJECTCODE	1-7 alphabetic	Project reference coding finalized for each project.
PHASE/ PARCEL	2 alphanumeric	Identifier of which area, phase, parcel or zone the project related toif the project is subdivided into parcels or zones.
TOWER NO./ TOWER NAME	3 alphanumeric / 3 alphabetic	Represents the number or name of the building, tower designated toit inthat zone, parcel and phase.
TYPE	2 alphanumeric	Document type, which will be M3 for 3D model files and QT forquantity take off.

DISCIPLINE	2 alphabetic	Indicates the discipline
MODEL DESCRIPTIO N	1-10 alphabetic	Indicates the model level division is the model is divided into variouslevels.

PROJECTCODE	TOWER NO./ TOWER NAME	TYPE	DISCIPLINE	MODEL DESCRIPTION
SDPL	A	M/QT	AR/ST/ME	Basement, Typical, Unit, Roof

Eg 1: SDPL-VJD-A-M-AR-Typical

Eg 2: SDPL-VJD-A-M-ST-Typical

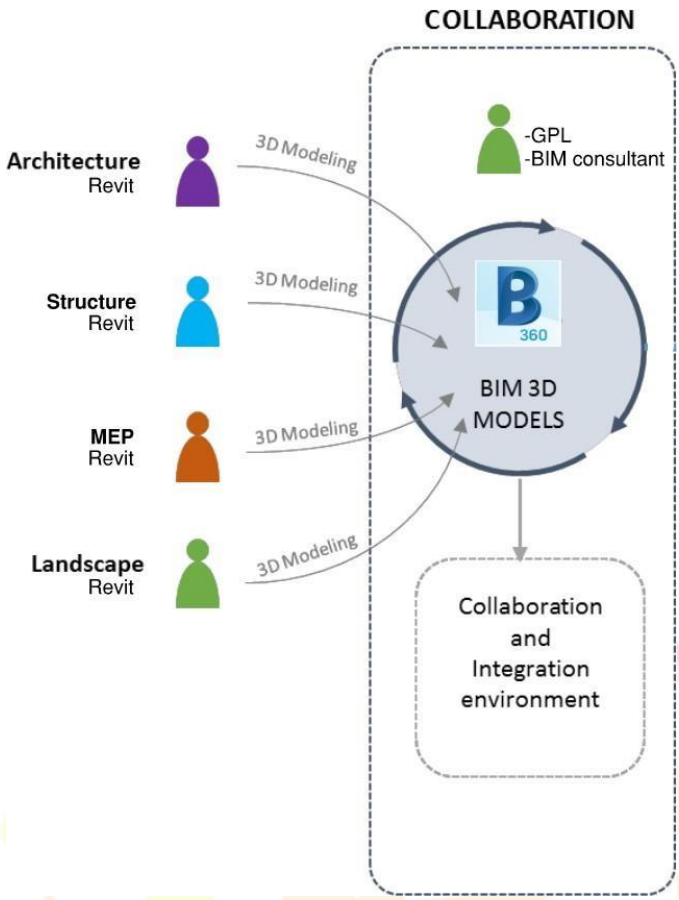
Eg 3: SDPL-VJD-A-M-PHE-Typical

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
AR	ARCHITECTURAL	**ID**	INTERIOR
ST	STRUCTURAL	**LS**	LANDSCAPING
ME	MECHANICAL ELECTRICAL PLUMBING	**QT**	QUANTIFICATION
PHE	PLUMBING	**SD**	SCHEMATIC DESIGN
ELV	ELV SYSTEMS	**DD**	DETAIL DESIGN STAGE
HV	HVAC	**GFC**	GOOD FOR CONSTRUCTION
FR	FIRE FIGHTING	**4D**	CONSTRUCTION SEQUENCING WITH TIMELINE.
EL	ELECTRICAL	**5D**	CONSTRUCTION SEQUENCING WITH COST

SECTION 6: COLLABORATION AND COORDINATION

A: COMMON DATA ENVIRONMENT/FILE SHARING

File sharing / collaboration to be hosted by MLDL on BIM 360 to track access and submission. Respective consultants to publish WIP models on weekly basis (Generallyevery Friday at EOD) and set for review in the status section. The models will then bereviewed and commented in the BIM 360. The platform is hosted by MLDL and the license to the Revit or any other collaborating software into the BIM 360 shall be acquired by the respective consultants.

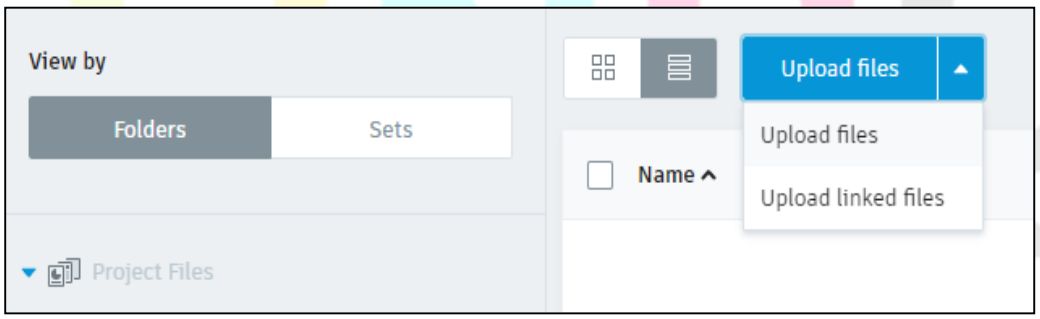


a) COMMON DATA ENVIRONMENT (CDE) FOLDER STRUCTURE

MLDL follows a set folder structure for BIM 360 Docs to keep a systematic record of the project models, clash reports, RFI's and shared models. Refer Appendix C for the folder structure.

b) DOCUMENT UPLOADING

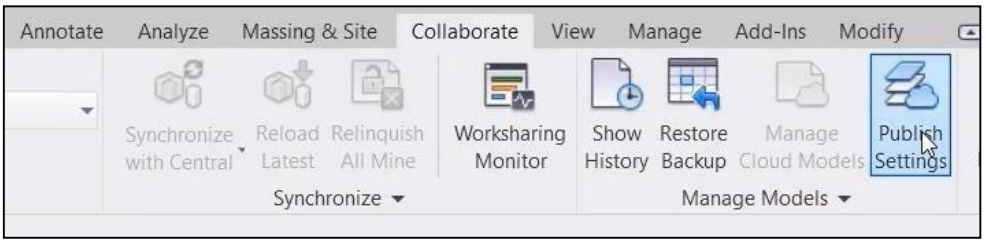
Any design related documents like DBR, TDD, etc. must be uploaded on BIM 360 correctly inrespective folders as defined.



c) MODEL COLLABORATION & PUBLISHING

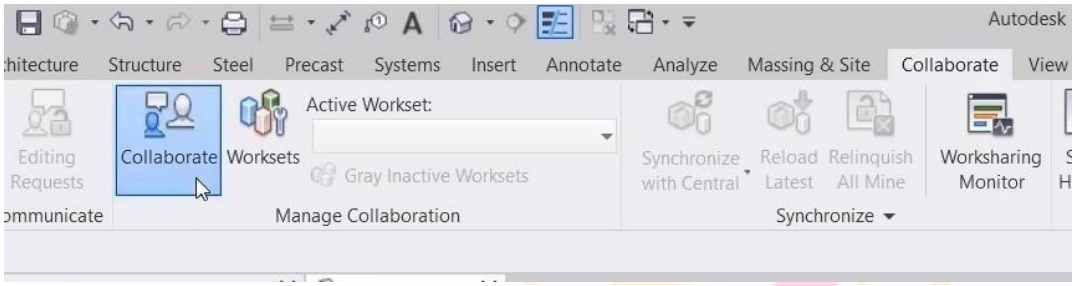
To share the model for various stake holders to review, the model must be published into BIM360.

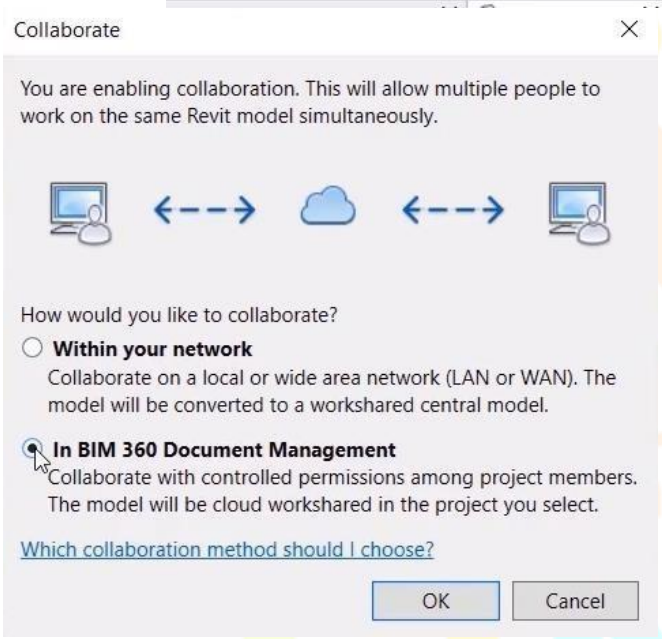
1.Publish settings" in collaborate tab to publish the 3d views, sheets into BIM 360.



2.Select views and sheets to be published into BIM 360.

3.Publish the model into BIM 360 by “Collaborate” option in collaborate tab.





d) MODEL CONSUMPTION

Model from the other disciplines (Architecture, Structure, MEP and Landscape) can be linkedwith each other for the coordination purpose in BIM 360.

1.Publish models from Revit to BIM 360 using Revit Cloud Work sharing.

2.Use the Design Collaboration module to create a package and share models with otherteams.

3.Other teams choose to consume the shared models.

4.The teams who have consumed the shared model use Revit to link to the model fromtheir Consumed folder in the Document Management module.

These files will then be downloaded by consultants and SDPL team to ensure a coordinatedproject delivery.

Formats for exchange of information:

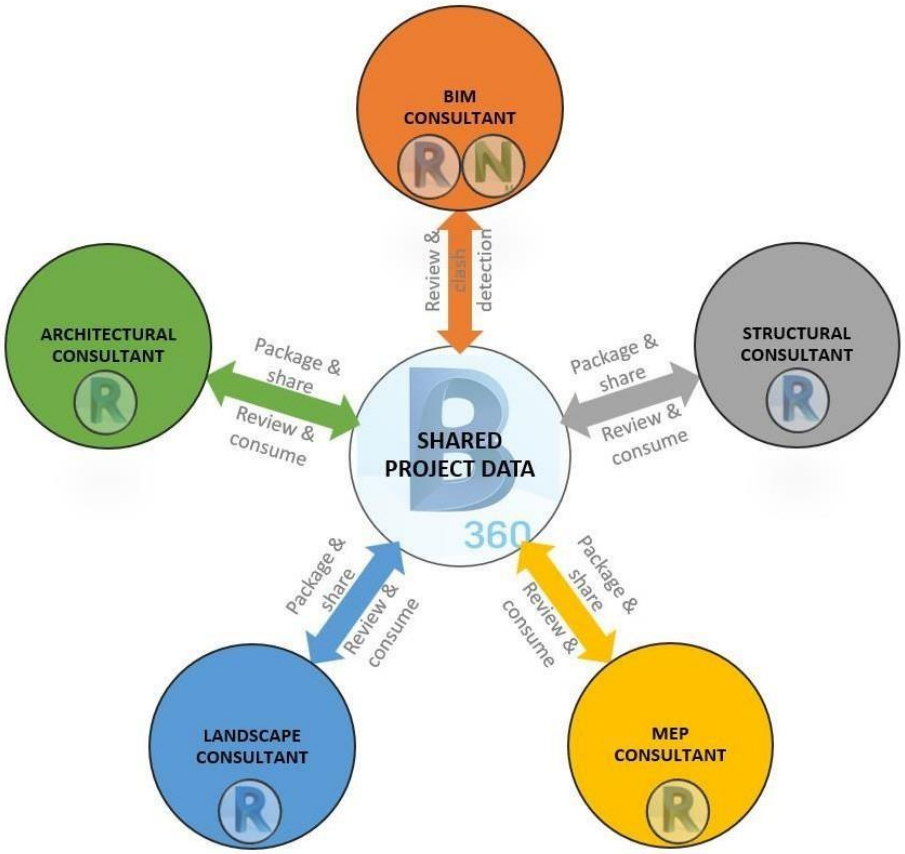
- RTE : Autodesk Revit Template
- RVT : Autodesk Revit files
- DWG :Autodesk Drawing files
- DWF : Autodesk Design Review files
- PNG / JPEG : Tagged Image File Format
- NWC : Navisworks Cache Format
- NWD: Navisworks Date Set Format
- NWF: Navisworks file format
- IFC: Object-Based Neutral File Format
- XLS/PDF: Project specification/information

B: REVIT FILE LINKING

Linking enables additional geometry and data to be referenced into a model. This may be eitherother parts of a project which are too big to manage in a single file, or data from another discipline or external company.

Some projects require that models of single buildings are split into multiple files and linked back together in order to maintain manageable model file size. In some large projects it is possible that all the linked models may never be brought together as one. Various container files shall exist to bring model files together for different purposes.

When first linking the models back together, “Shared Coordinates” shall be used as the insertion mechanism



F: CLASH DETECTION

It is suggested to run a basic level of interference check in Revit by the design consultants to ensure basic level of design coordination among various disciplines.

For coordination and clash reporting, Revit models shall be reviewed and coordinated using NavisWorks Manage at scheduled intervals in during the project. An .nwd /.nwc file shall be loaded onto the shared work area of the project and clash detection shall be executed for eachRevit model submission within NavisWorks Manage to be shared amongst the project parties.

Clash results need to be assessed in the context of the elements being analysed, and the type ofclash detection software being used.

Adopted tolerance levels at various stages for clash detection:

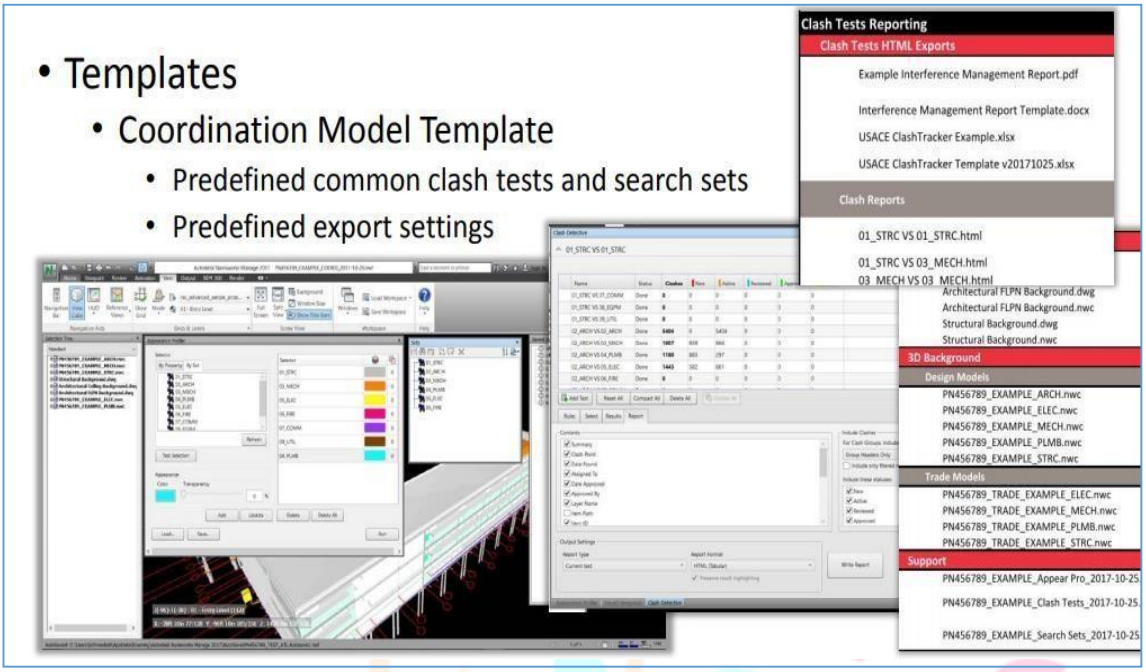
	STAGE	DISCIPLINES	TOLERANCE
1.	DD stage	Arch vs Str	10mm
		Str vs MEP	05mm
		Arch vs MEP	05mm
2.	GFC stage	Arch vs Str	05mm
		Str vs MEP	05mm
		Arch vs MEP	05mm

Following the appropriate adjustment to the detection tolerance, each clash produced in the resultant report along with the .html file shall be distributed and dealt with by the relevant partybefore the next model submission.

- It is the responsibility of the BIM consultant to perform the clash detections and report.
- During coordination, discipline models can be amended depending on the type of coordination needed.
- The BIM project Coordinator shall distribute a log of hard interferences (for example, mechanical vs. structural or mechanical vs. mechanical overlaps in the same location) and soft interferences (for example, conflicts regarding service access, fireproofing, andinsulation) in a written report to all disciplines involved.
- The documentation shall be complete, and resolutions shall be documented prior to anysubmission, and included as part of Quality Assurance and Quality Control (QA/QC) documentation. The Project team shall present all completed clash detection reports tothe Project's QC Manager prior to any formal QC event.
- All reported interferences must be resolved prior to the formal QC checks.

Navisworks file format –

.NWC	By default, when you open or append any native CAD or laser scan files in Autodesk. Navisworks, a cache file is created in the same directory and with the same name as the original file, but with an .nwc file extension.
.NWD	An NWD file contains all model geometry together with Autodesk Navisworks-specific data, Such as review markups.
.NWF	An NWF file contains links to the original native files (as listed on the Selection Tree) together with Autodesk Navisworks-specific data, such as review markups.



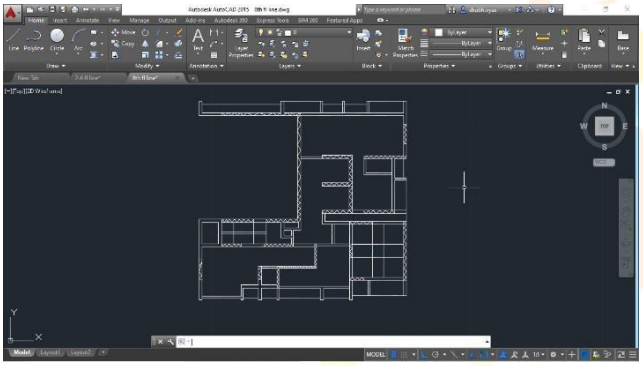


Fig: 3.2 2nd – 7th Floor Plan

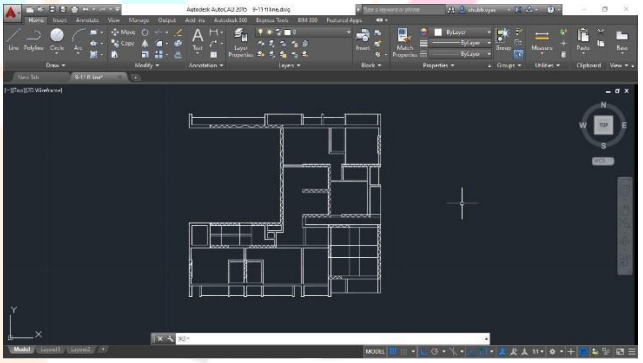


Fig: 3.3 8th Floor Plan

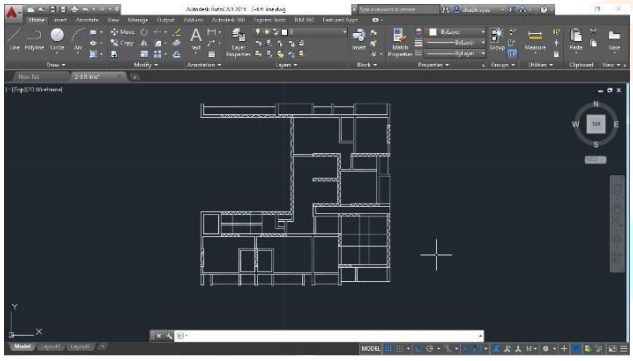


Fig: 3.4 9th -11th Floor Plan

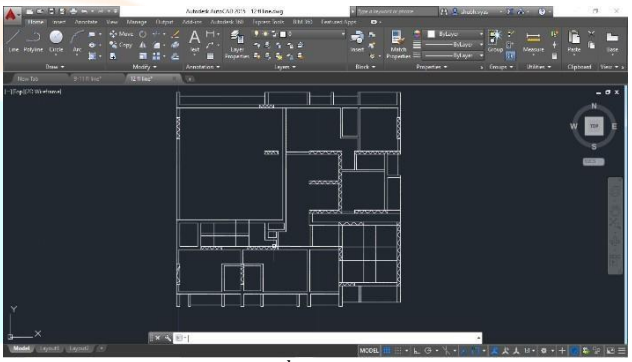


Fig 3.5 12th Floor Plan

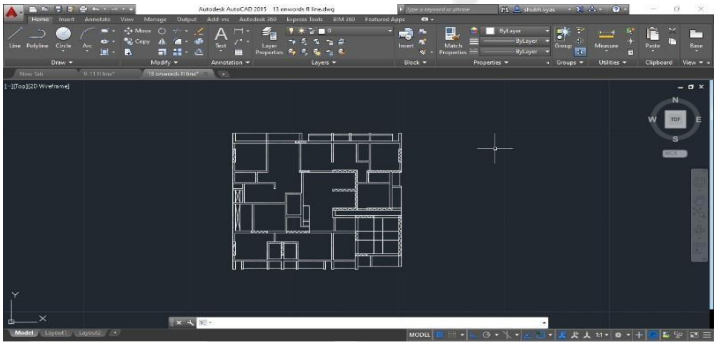


Fig: 3.6 13th -14th Floor Plan

Step: 1

Drawing a plan drawings in AutoCAD with proper notations and dimensions.

We have created 6 different cad drawings. Because 2-7 floor is same 8 floor is refuse areaand again 9-11 floors is similar to 2-6 but there are some small changes. 12 floorsis againrefuse area and her car parking area ends. 13-14 floors has different floor layout.

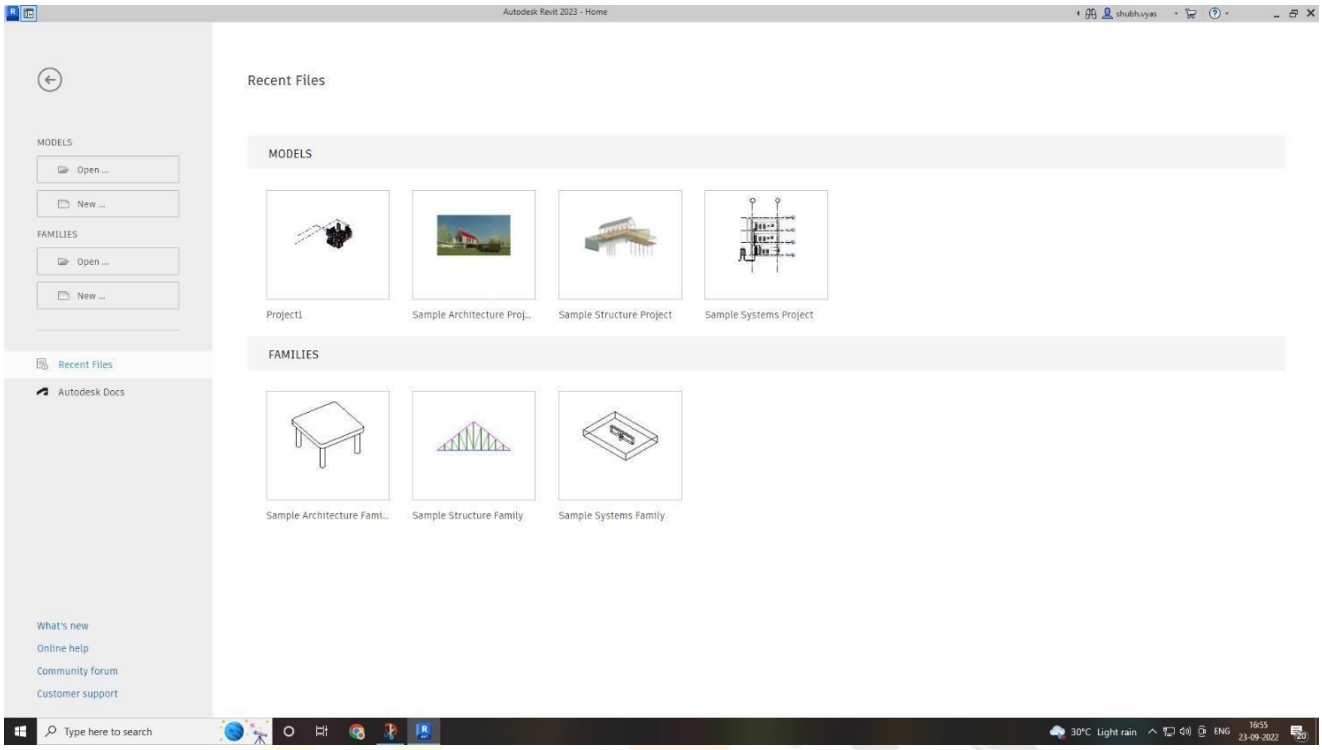


Fig. 3.7 Introduction

Step: 2

Now open Revit.

This where you can create your files and locate it in your desired locations.

Note:

If you want to work on new project then clickthis button.Here we can also see old projects and family

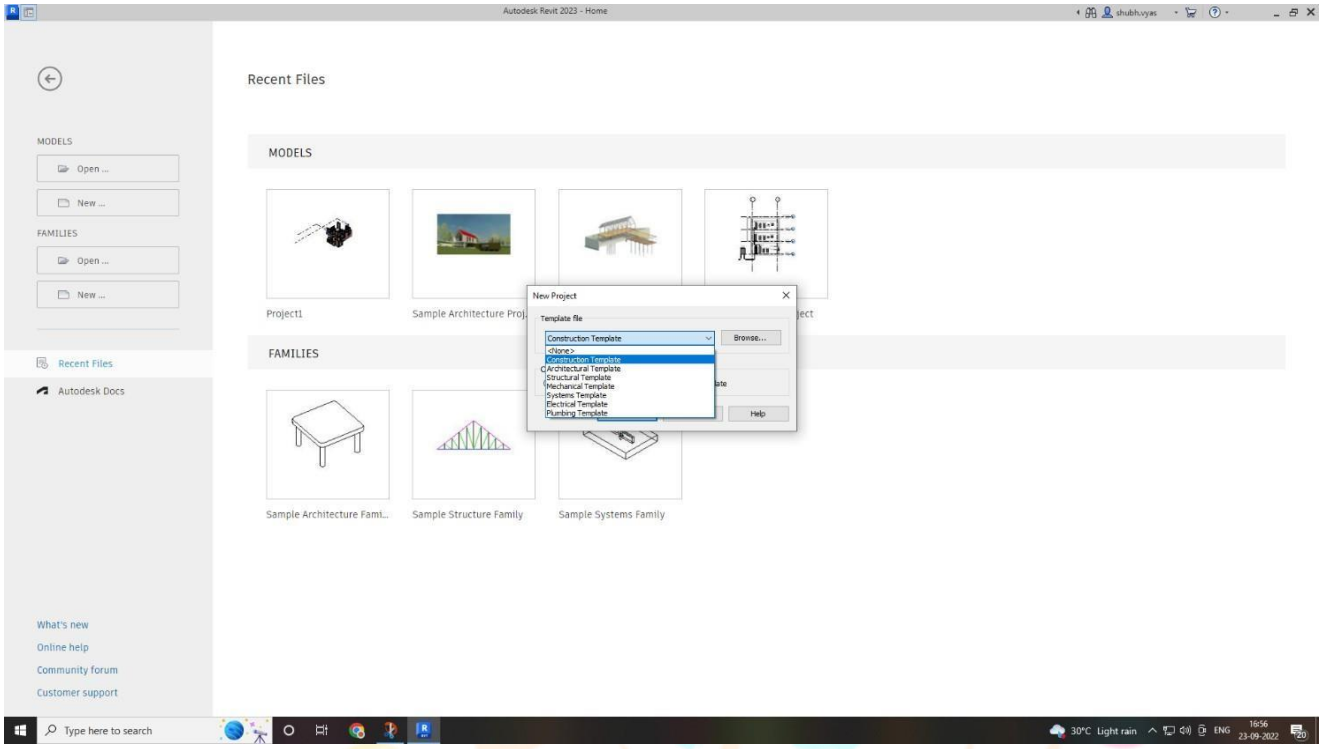


Fig: 3.8 Selection of template

Step: 3

If you want to work on new project then clickthis button.Here we can also see old projects and family.

We will click on create new project.

Now we have to select template. It is dependent on type of model youwant build.We will select architectural.

And press ok.

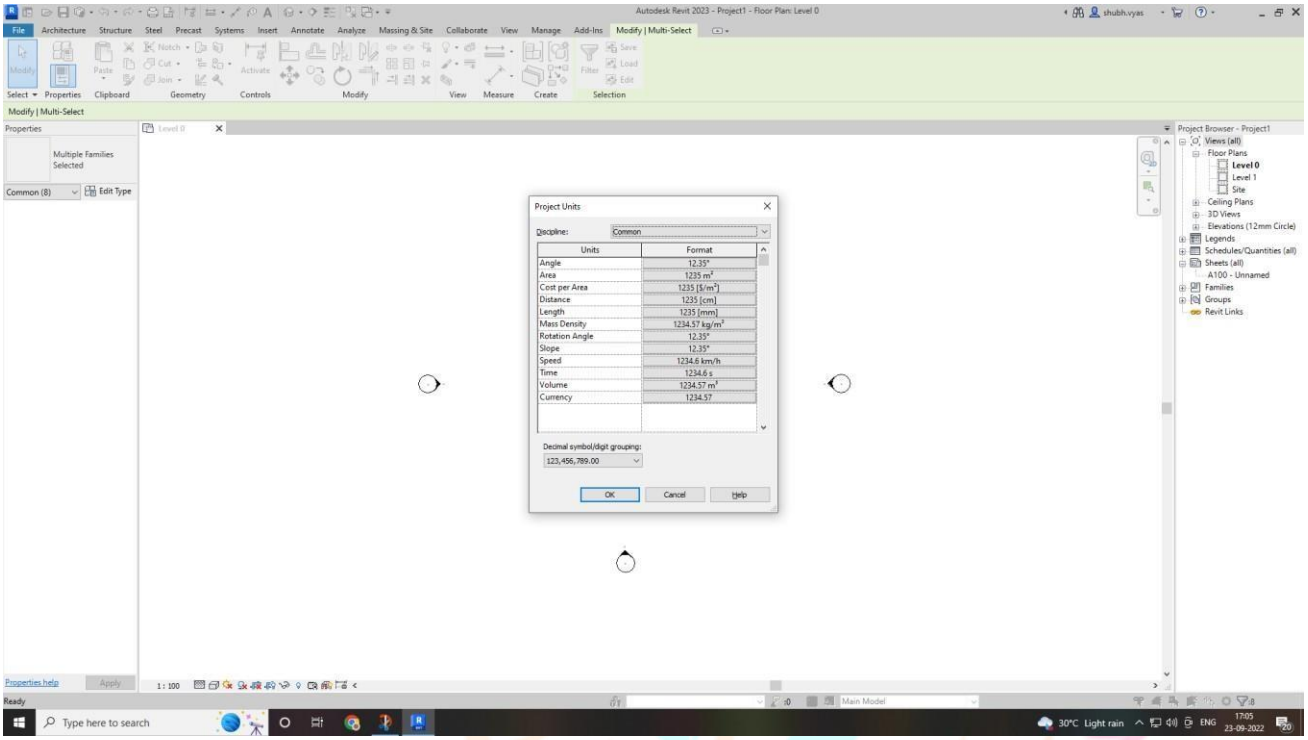


Fig: 3.9 Set Units

Step: 4

Set units Set units in which you want to work.Owner drawings and made in meter so we will use meter.You can even change units in between.

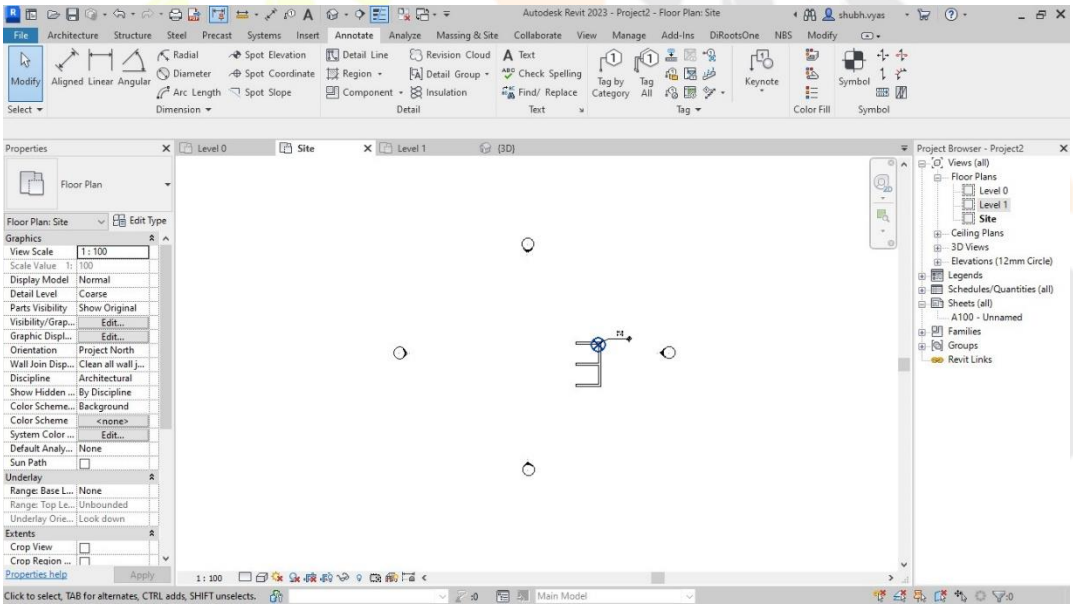


Fig: 3.9 Adjusting model on coordinates

Step: 4

Create Shear wall of lifts.

Then turn on project base point. Then link datum file to the project.

Move your model to project base point. And move model and project base point to projectbase point of datum file.

Go to manage tab → go to coordinates → go to acquire coordinates → select link.Now coordinates is set to model.

Building	Location	North	East	Angle
A	Passenger lift corner	19.2	73	15.00

Coordinates should be according to above mention numbers.

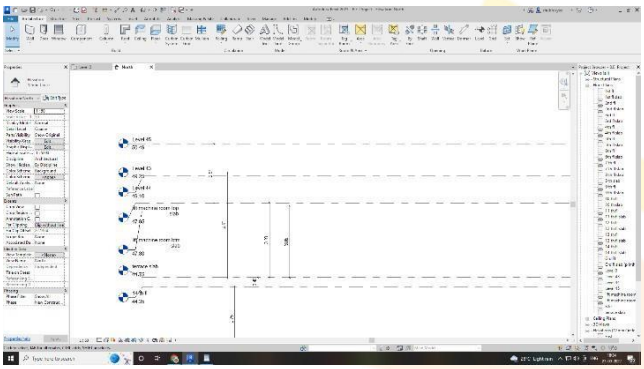


Fig: 3.10 Levels of terrace levels

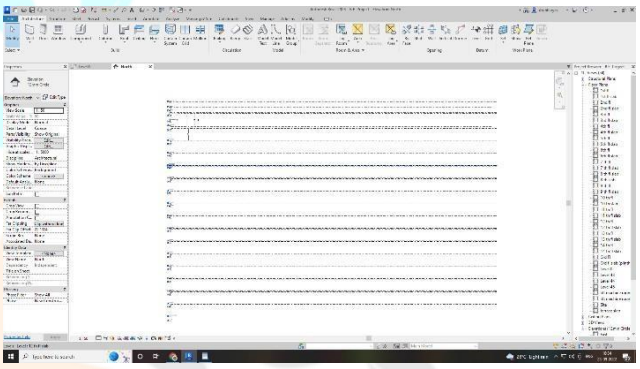


Fig: 3.11 All the levels in project

Step: 4

Copy Levels from datum file.

Open any elevation.

Go to Collaborate tab → Select Copy Monitor → Select all levels from datum file → ClickFinish.

Now Go to Views → Click Plan View → Select all the levels → Click Enter.

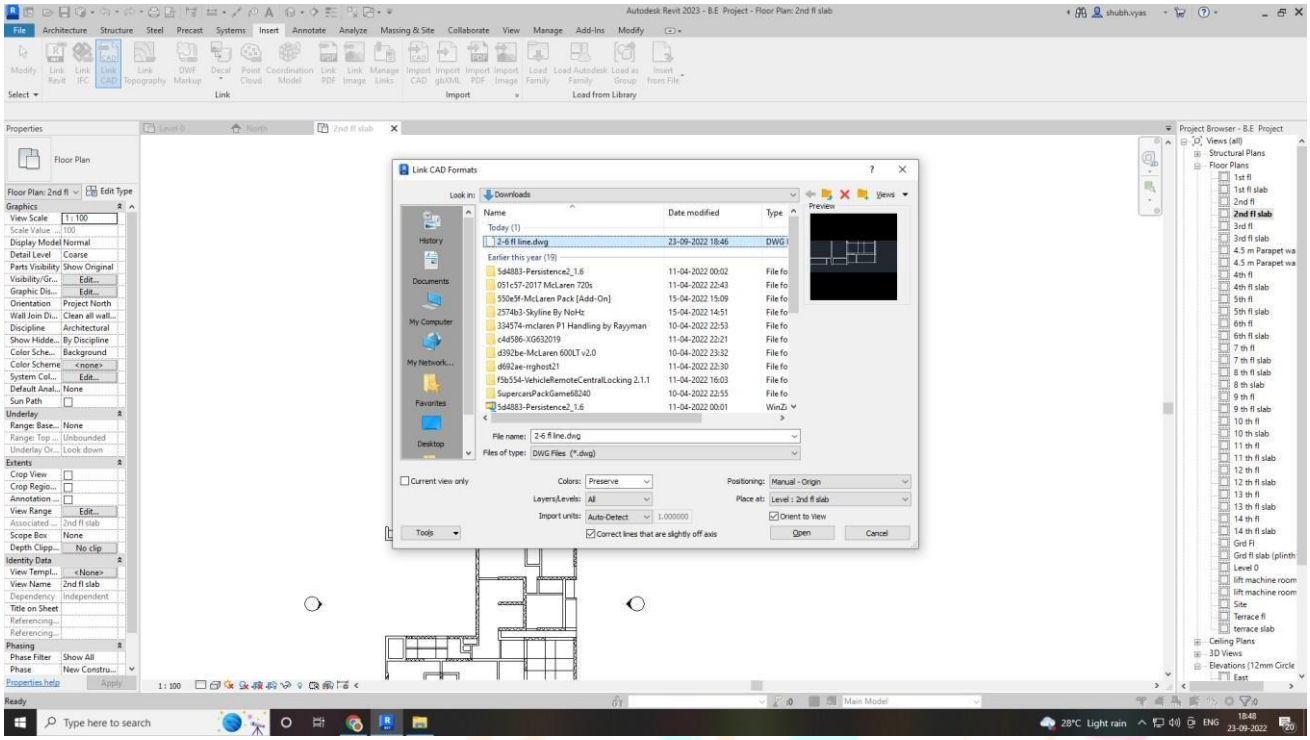


Fig: 3.12 Link Cad File

Step: 6

Link cad

Now link cad drawing to project according to drawing and respected levels.

Benefits of Linking Cad file is, if changes made in cad file will also appear in Revitsimultaneously.

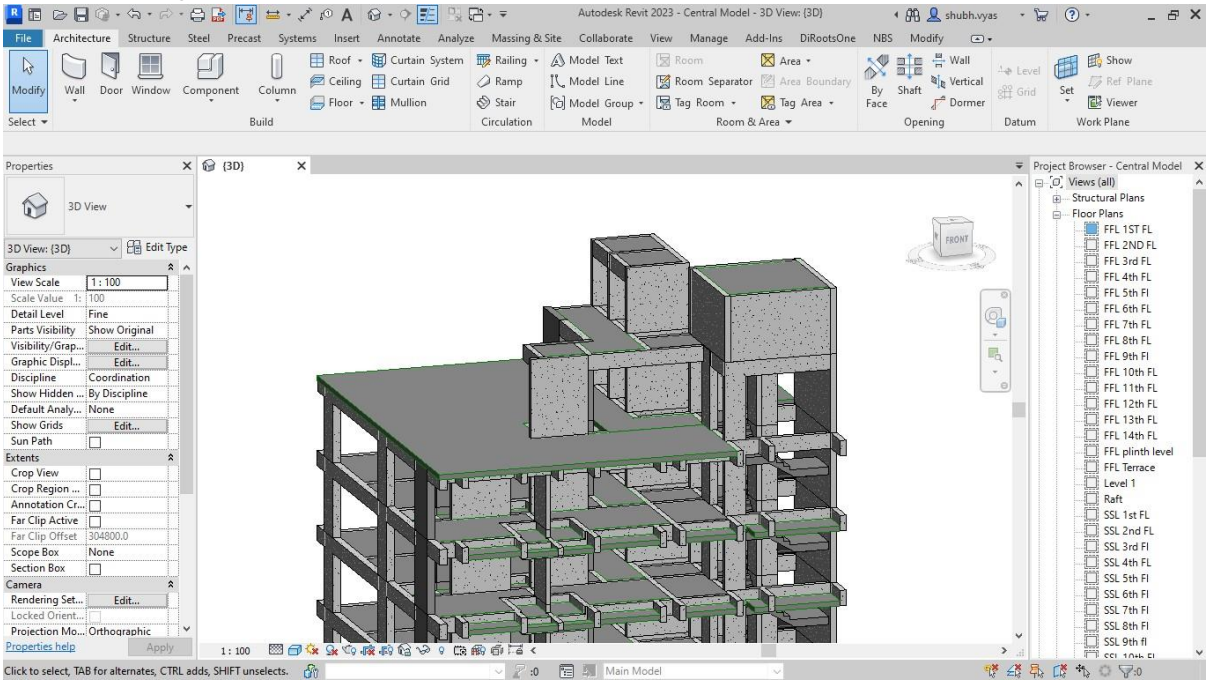


Fig: 3.12 Structural model

Step: 6

Now model all the Structural elements which includes.

- Columns
- Connections
- RCC Slabs
- Foundations and PCC
- RCC Framing/Beams
- RCC Generic Models
- Retaining Walls
- Structural Walls
- RCC Stairs
- Nonstructural Walls
- RCC Ramps etc.
- Shaft & Wall sleeves(to be copy/monitored from MEPF model)
- Cut-outs

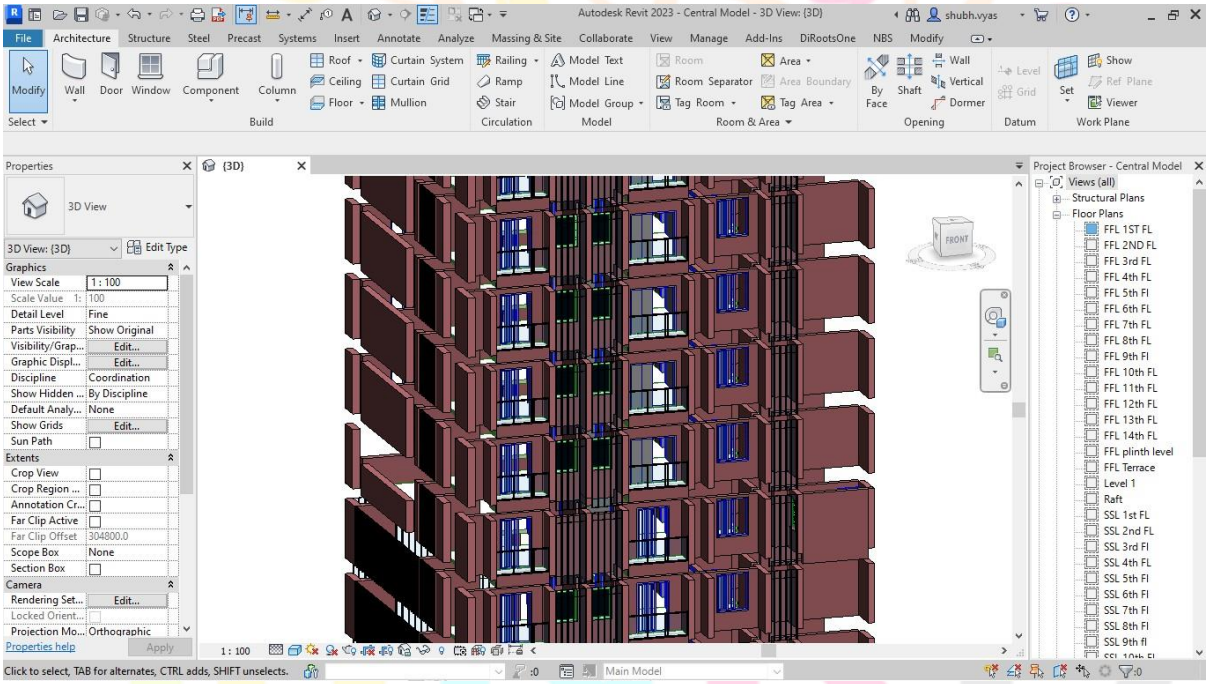


Fig: 3.12 Architecture model

Step: 6

Now model all the Architectural elements which includes.

- Casework
- Ceilings
- Columns [Arch non-analytical columns]
- Curtain walls and panels
- Detail Components
- Doors
- Entourage

- Floors
- Furniture
- Generic Models
- Planting
- Profiles
- Families
- Roofs
- Balusters
- Windows
- Sanitary Fixtures
- Shaft
- Architectural Finishes etc…

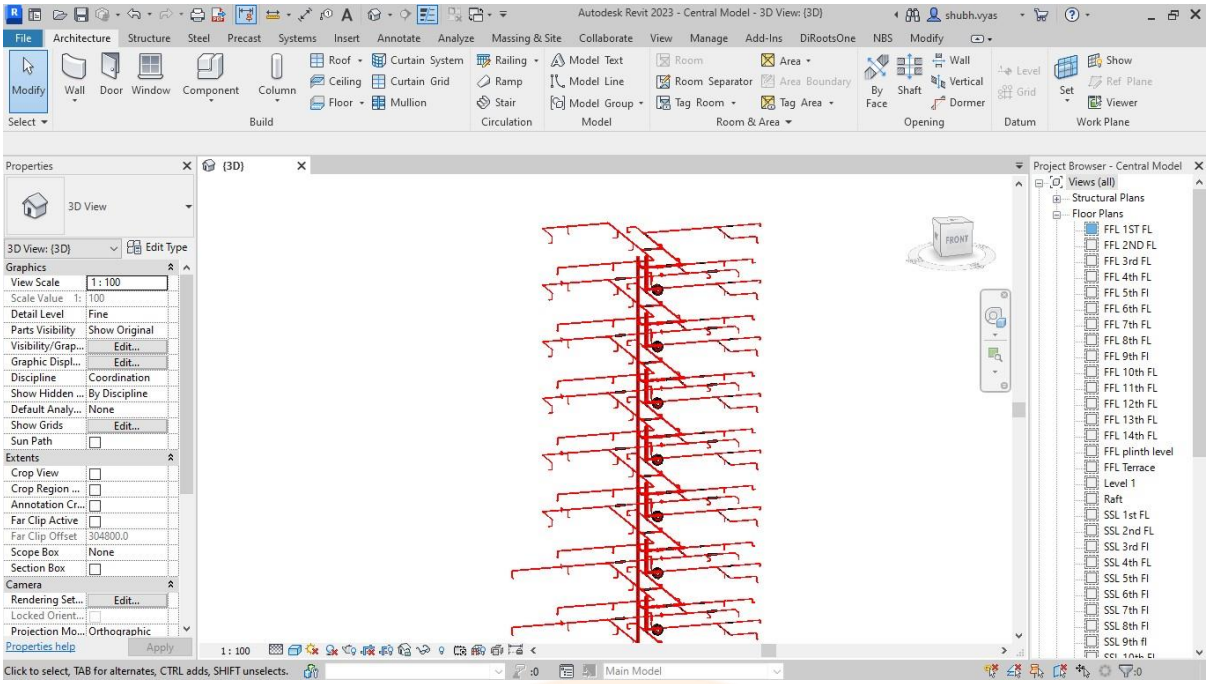


Fig: 3.12 Fire model

Step: 6

Now model all the Firefighting elements which includes.

- Fire Fighting Hydrant System
- Fire Fighting Sprinkler System
- Fire Protection Equipment
- All Fittings
- BMS System and Equipment's etc…
- Wall sleeves
- Cut-outs
- Sprinklers

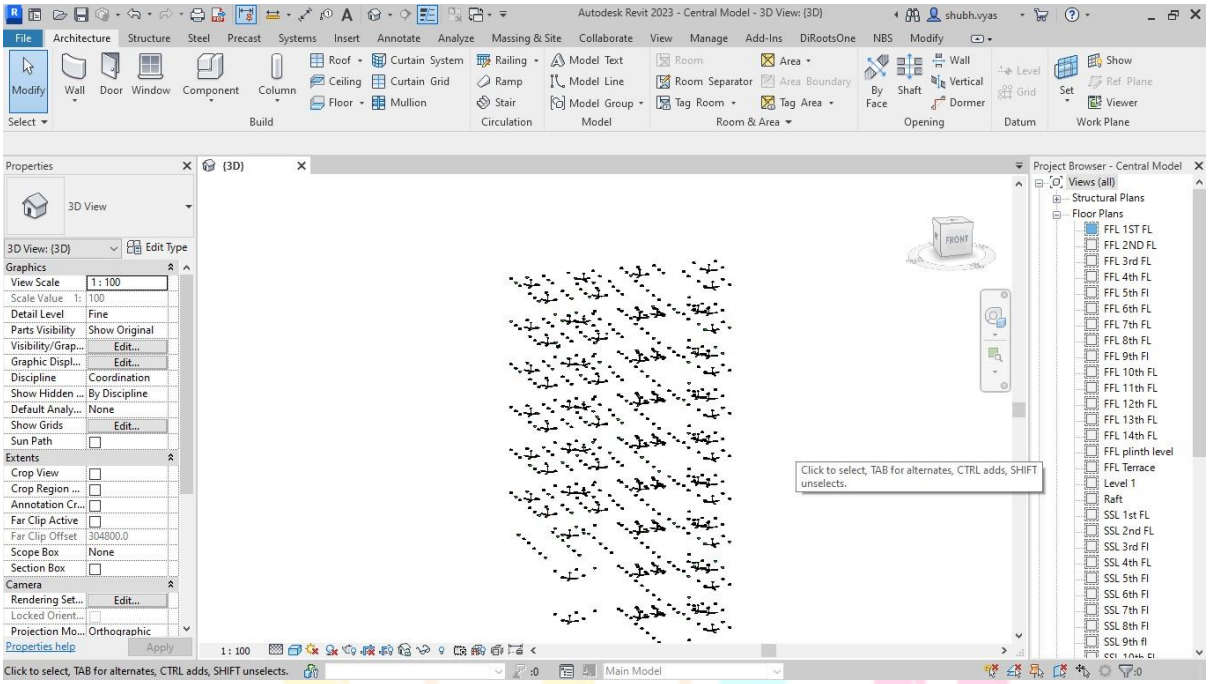


Fig: 3.12 Electrical model

Step: 6

Now model all the Electrical elements which includes.

- Electrical conduits
- Electrical Fixtures (Switch board, Wall &Ceiling light, Fan etc.)
- Lighting Fixtures and Devices
- Electrical Fixtures (Distribution Board,meter room, ELV box etc.)
- Electrical Socket and switches etc…(to becopy monitored from Arch Model)
- Cable tray and its fittings
- Conduits
- Lightning Protection System (LightningArrester, G.I. Strip, Down Conductor,Earth Test Link, Earth Termination Linketc.)
- Earthing System (Earthing Wire, Earthing G.I. Strip, Earth Electrode, G.I./CopperEarthing Pit etc.)
- D.G. Set System (D.G. Set, AMF Panel,
- D.G. Panel, SLFP etc.)

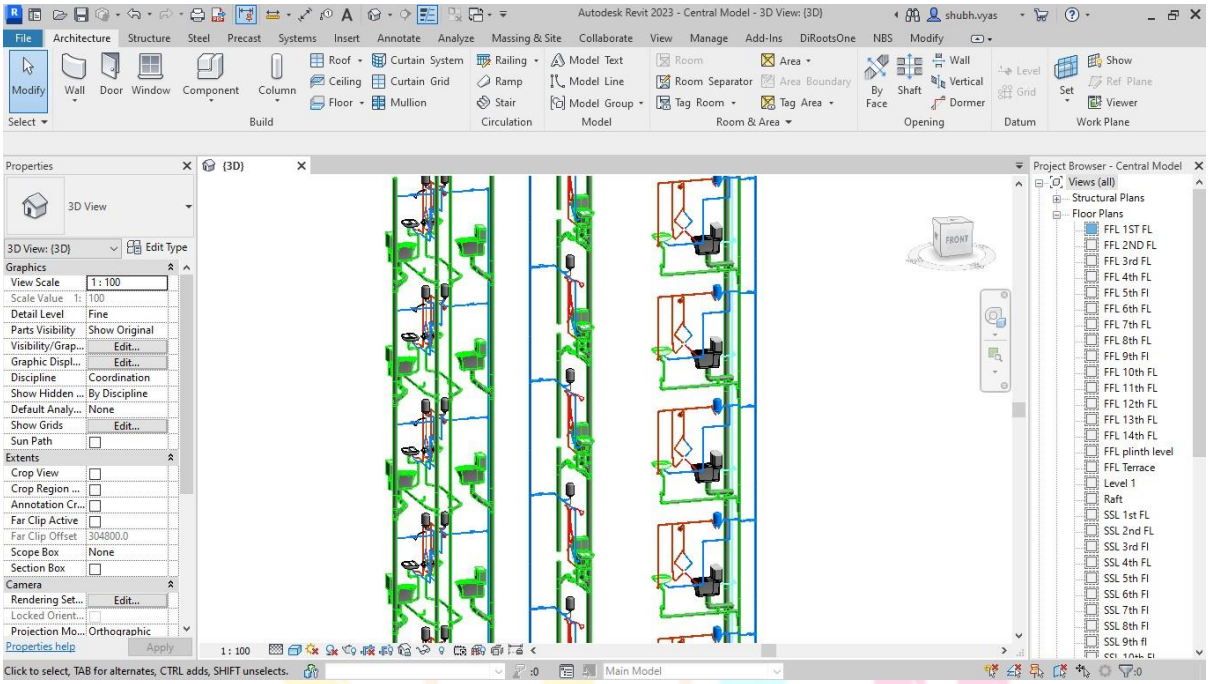


Fig: 3.12 plumbing model

Step: 6

Now model all the Plumbing elements which includes.

- Domestic cold-water pipe & pipe fittings
- Flushing cold-water pipe & pipe fittings
- Solar hot water pipe & pipe fittings
- Hot water pipe & pipe fittings
- Irrigation water pipe & pipe fittings
- Ball valves
- Butterfly valve
- Non-return valve
- G.I./PVC sleeves
- Vent pipe, Vent cowl & pipe fitting
- Plumbing fixtures (washbasin, water closetwall hung, shower diverter/mixer,kitchen sink, electric water heater, tap, health faucet etc.)
- External sewer drainage pipe & pipefittings
- Gully trap
- Cut-outs

CHAPTER 3

BIM 360

Effective February 9, 2021, BIM 360 Design™ software has been renamed and upgraded to BIM Collaborate Pro™. The software now offers new modules, including Model Coordinationand Insights*, and access to the new Autodesk Construction Cloud platform at no additional cost.

Continued support for BIM 360 Design

If you are a current BIM 360 Design subscriber, you automatically receive access to BIM Collaborate Pro. The offering name change does not affect your ongoing work on BIM 360 projects. You may continue collaborating on both the BIM 360 and the unified Autodesk Construction Cloud platforms for new projects.

3.1 BIM 360 Design product support

3.1.1Purchase BIM Collaborate Pro

BIM Collaborate Pro is the next evolution of Autodesk's fast-growing design collaboration solution for AEC teams. It adds clash analysis, project insights, and improved design-to- construction connection with access to both BIM 360 and the Autodesk Construction cloud.

BIM 360 is Autodesk's cloud based common data environment. Even midsized projects have model sharing needs. With the work from home model now standard across many industries, we're all used to storing our files on cloud drives like OneDrive or Dropbox.

Storing Revit models in these services present two problems. One, we can't collaborate througha central model workflow like we can on a local network. Two, we can't access the informationin the model in the cloud. BIM 360 solves both of these core problems with a growing featureset.

BIM 360 is purpose built for the building delivery in the Autodesk ecosystem. Revit and designmodeling is at its center, but platform features are expanding both ways. Two exciting areas that expand the read of BIM is coordination and field management.

3.2 BIM 360 is a growing and changing platform, as of this writing it'sdivided into four modules.

3.2.1BIM 360 Docs

- Cloud drive for documents
- Document management
- Document viewing and markup sharing.

3.2.2BIM 360 Design

- Revit collaboration in the cloud
- Version control and iterative collaboration

3.2.3BIM 360 Coordinate

- Model coordination
- Clash detection

3.2.4BIM 360 Build

- Field management
- Project management

BIM 360 is a unified cloud-based platform from the Autodesk stable that connects teams, project data, and workflows in real-time. It facilitates informed decision making throughout the lifecycle of the project by streamlining the design process through documentation, design reviews, and quality & safety checks.

This integration of data and people help all project stakeholders keep the 'bigger picture' in mind during the job to produce a high-quality design.

BIM 360 provides centralized access to project data. It enables the entire project team to collaborate anytime, anywhere.

3.3 BIM 360 Benefits

Centralized location — Information can be easily created and shared with teams in multiplelocations.

24*7 availability — Reduces turnaround time by facilitating working in real-time and information coordination

Up to date information — Cloud-based collaboration ensures access to the latest project data Easy access — Easy access to information without reliance on IT and traditional platforms ofinformation sharing

Data security — Password protected to ensure complete security of data streamlined BIMworkflows

Enhanced quality and safety

Reduces instances of errors and saves time.

3.3 BIM 360 Applications in construction

3.3.1. Design

BIM 360 Design is a collaboration service that enables real-time data management and collaboration. It operates as a single source of truth and offers centralized access to project datato team members. AEC project processes are complex and iterative. BIM 360 Design has powerful markup, access control, and mobile review facilities for BIM workflows. Teams cannow easily share design updates and status.

Single source of information traditional methods involved moving files around servers, FTP &individual users. Information in BIM 360 is stored in one location, which acts as a single sourceof truth.

3.3.2 Document management

Central models can be directly saved on the cloud in the respective project and trade folder. User access to files can be regulated through the permissions feature of BIM 360. Permissionsrange from –

View only — User can view documents, create private markups and issues.View + Download

Upload only — User can upload documents, but the contents of the folder will not be visible. View + download + upload — User can share documents with the team and view any documentin that folder.

View + download + upload + edit — User can share, view, and edit documents and publishmarkups.

Folder control — User can share documents with team members, view and edit other documents in the folder. Moreover, they can also create title blocks, manage permissions, addmembers, and edit set assignments.

Publishing

The Manage Cloud Models option allows the project files to be published in just one click. These files do not have to be transmitted to an FTP location to be shared with other team members.

Subsequently, all team members can view the drawing sets without having to download them.BIM 360 also has an archival tool that keeps a record of different file versions. It provides thecapability to compare any two versions of a file. The changes will be displayed as shown in theimage below. The changes are categorized into –

· Added
· Modified
· Removed

3.3.3. Site layout

BIM 360 Layout allows contractors to link the coordinated model directly to the field layout process with robotic total stations and GPS devices. This enhances site productivity and reduces rework and waste. Easy accessibility to documents and drawings via the cloud ensuresthat everyone has the latest document versions and is working from a single source of truth.

3.3.4. Construction Safety

Safety checklists can be imported into BIM 360 and then accessed on mobile devices on-site. Checklists can be modified with easy to use drag and drop tools. After a checklist is prepared,it is assigned to the respective contractor with the location and date. It is then shared with the project team.

The contractor can access the checklist on any mobile device, go through it and check the itemsthat have been completed or indicate if there is an issue.

3.3.5. Quality Check

Keeping track of a project's progress on a daily basis is made easy with BIM 360's Daily Logscapability. From weather reports, labor tracking to site-related information, site data can be accessed from any mobile device. Daily logs are also archived so that they can be viewed at a later date.

BIM 360's Issue Management feature facilitates the creation of issue creation, tagging, and assigning them to respective team members. Issue management in a unified platform like BIM360 ensures efficiency in workflows.

3.3.6. Digital Equipment Management

Tracking of construction assets is a time consuming and painstaking process. BIM 360 providesa coordinated asset management system with a centralized database which simplifies the management of construction assets. The benefits of this system are –

No delays

No cost overruns

Reduced risk due to correct asset installation

3.3.7. Analytical Reports

Analytical reports in BIM 360 provide reports on project performance and prioritizes daily activities. It has an in-built AI-driven ''construction IQ'' that identifies high-risk issues that can jeopardize cost, safety, and schedule.

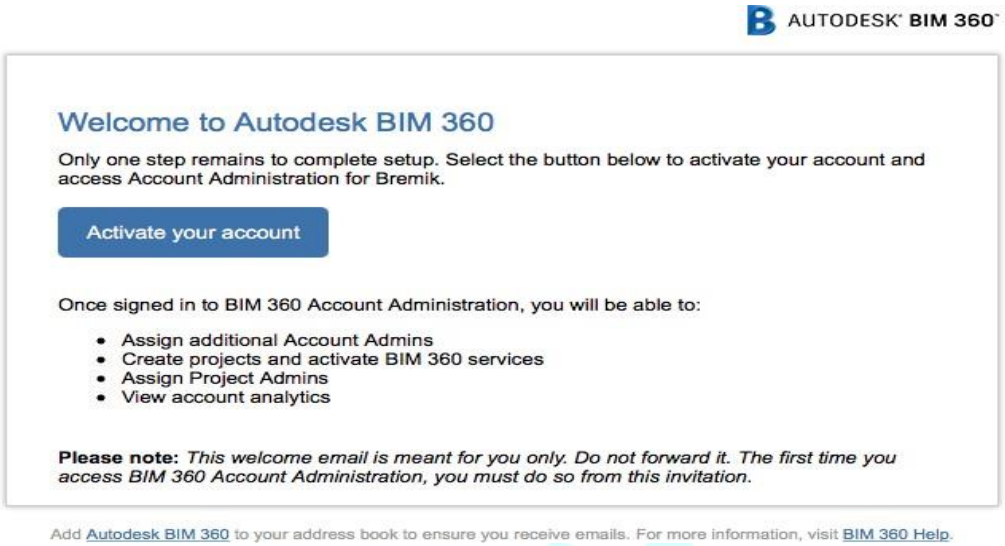
3.4 How to use BIM 360

This guide details the steps to quickly set up BIM 360 service for your project, including:

- Account Administration
- Project Creation
- Service Activation

3.4.1 Getting Started

Once your BIM 360 subscription is activated, the Account Administrator will automatically receive a welcome email with a link to get started.



Selecting the "Activate your account" button in the email will launch the Account Administration portal. Sign into Account Administration with your Autodesk ID. If you don't have an Autodesk ID, you can select the "Create Account" button to create one. Please note: Each welcome email ismeant for only one person. Do not forward it to others. The first time you access to account administration, you do so from the email invitation.

How can I tell if I'm an Account Administrator?

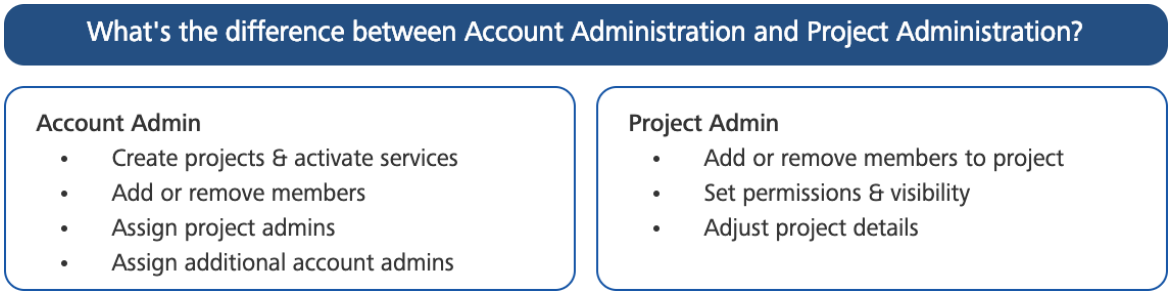
1.You received the welcome email

2.You can login to: admin.b360.autodesk.com

3.This link shows you an Account Administration button

3.4.2 Account Administration

Through the Account Administration portal, you can manage your BIM 360 account, includingprojects, members, and companies. You can link to Account Administration directly by visitingadmin.b360.autodesk.com (Link to the EU Server: admin.b360.eu.autodesk.com). BIM 360 has two levels of administration to ensure security and control across your projects: Account Administration and Project Administration. Only Account Admins have the ability to create new projects, activate BIM 360 services, and assign Project Administrators.



Use the **Account Settings** tab to customize your account (Item H, below). You can upload yourcompany logo, edit your account name, and invite account admins, and define business units for reporting.

To add additional account administrators:

1.In Account Settings, select the + icon.

2.Add account admin by entering the name or email address and save.

3.BIM 360 will send the new account admin an email invitation

Project Activation
From the Projects menu, you can create a project and activate BIM 360 service in two steps.
Step 1 - Create a Project
1.Select the Projects tab on the toolbar (Item 1, below).
2.Click the *Add* button to start a new project.
3.Enter project information (required fields are marked with an asterisk).

Step 2 – Activate Service

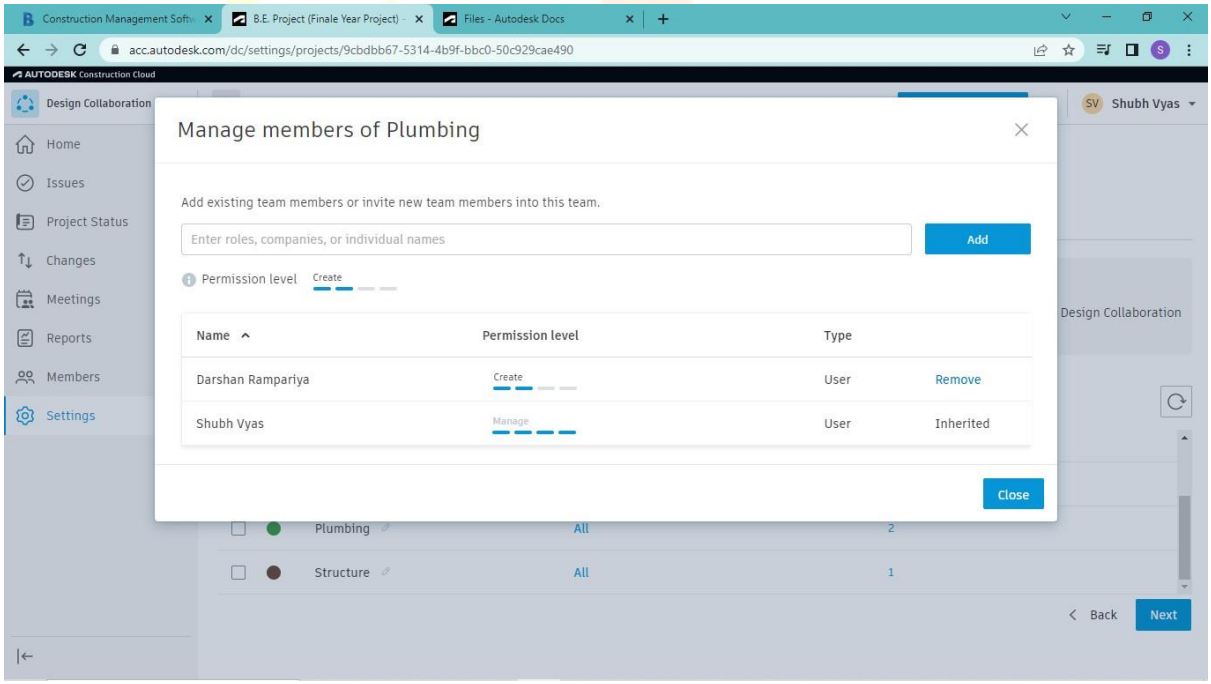
1.Click the Activate button for the desired BIM 360 service.

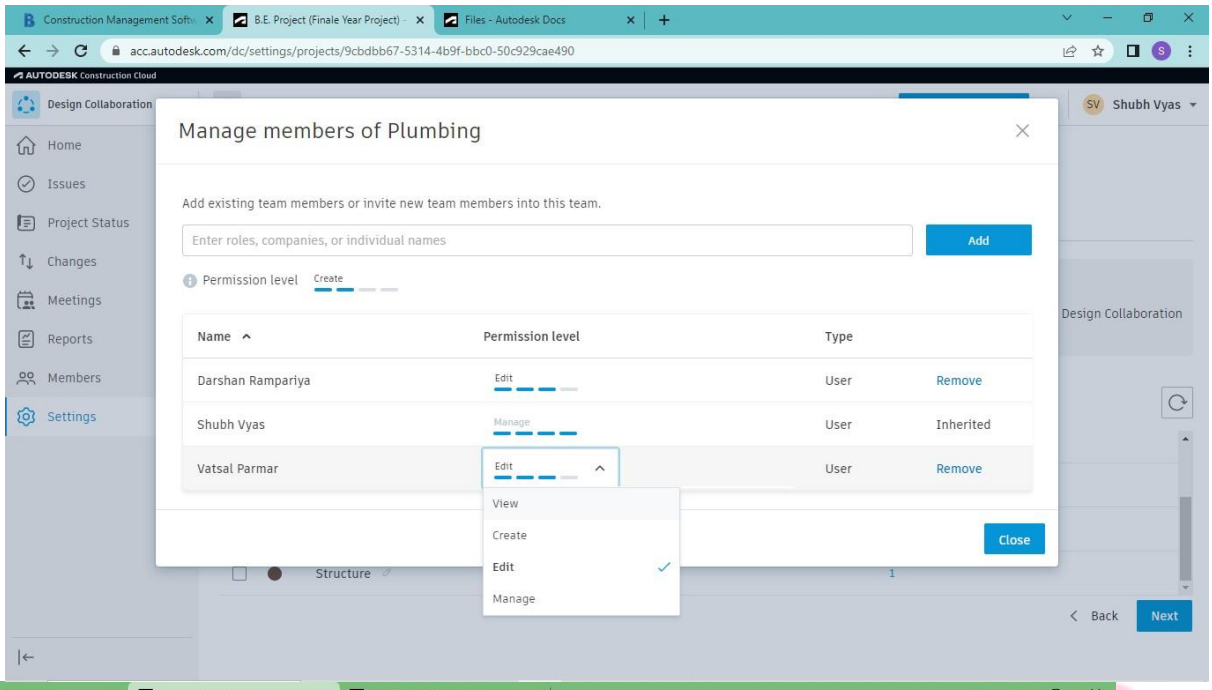
2.Assign a project administrator. You may add multiple project admins.

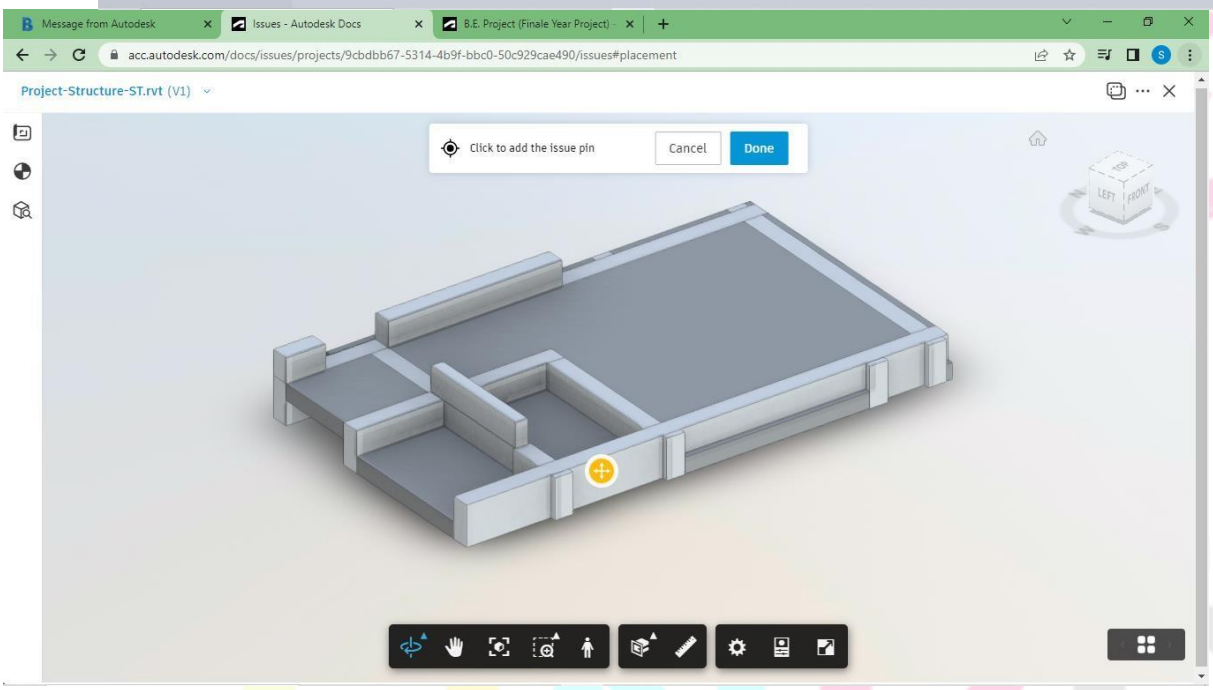
3.The project admin will receive an invitation email. They will need to click the link theemail to join the project.

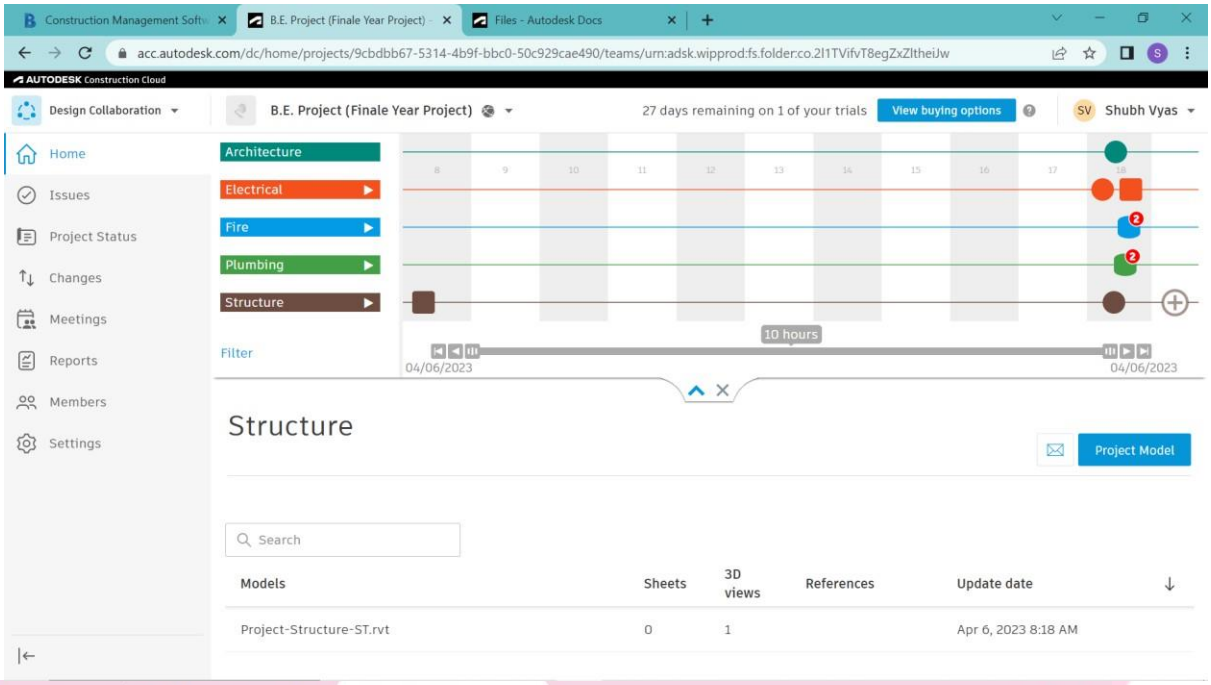
That's it! You're ready to set up your project.

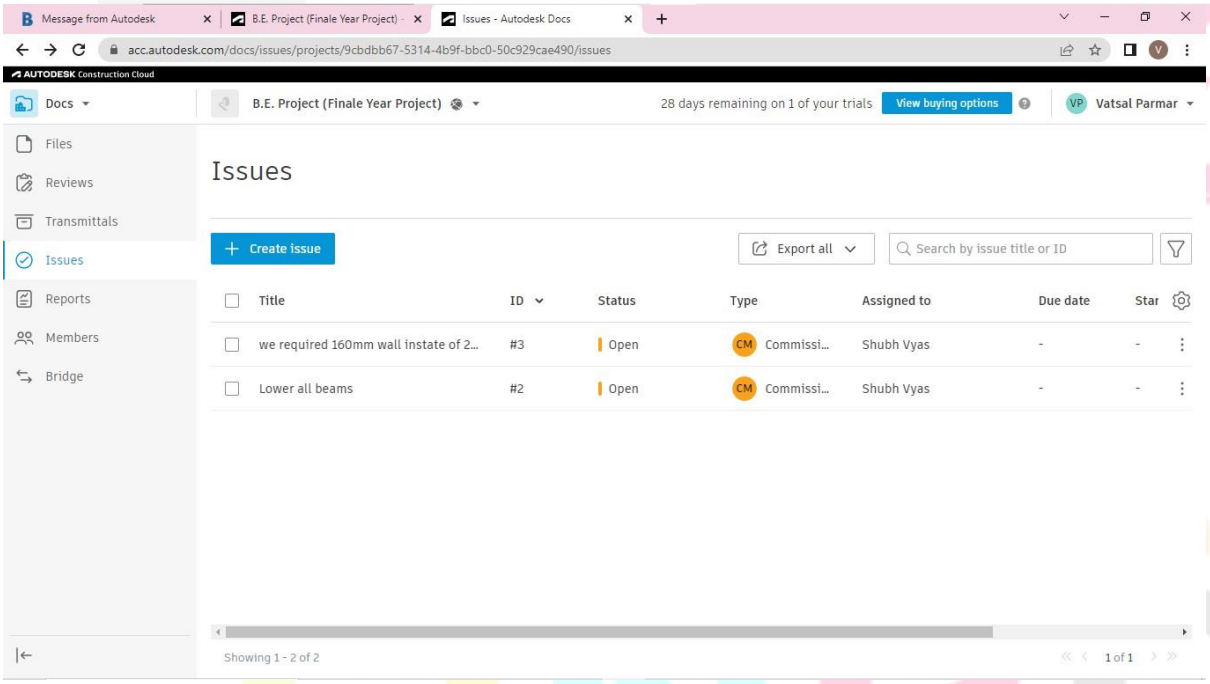
3.5 Our BIM 360 account Photos

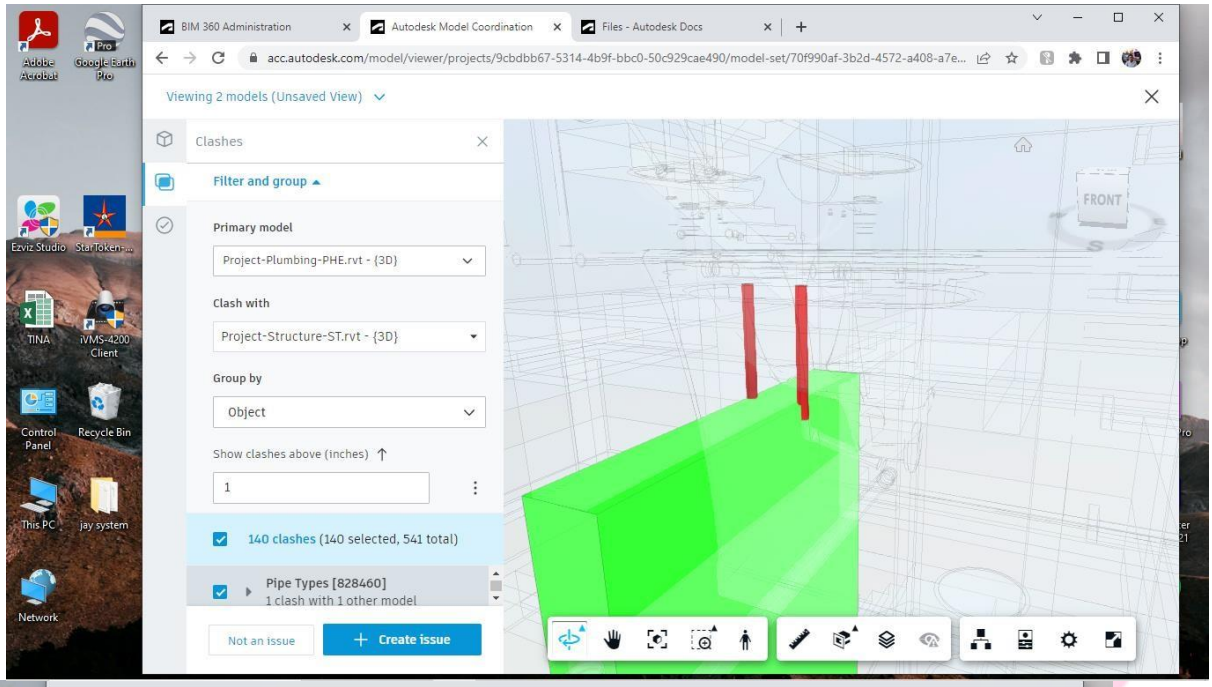



Manage members of Plumbing
Add existing team members or invite new team members into this team.
Enter roles, companies, or individual names
Add
Permission level
Create
Name
Permission level
Type
Darshan Rampariya
Edit
User
Remove
Shubh Vyas
Manage
User
Inherited
Vatsal Parmar
Edit
User
Remove
View
Create
Edit
Manage
Close
Design Collaboration
Home
Issues
Project Status
Changes
Meetings
Reports
Members
Settings
Structure
Back
Next


Project-Structure-ST.rvt (V1)
Click to add the issue pin
Cancel
Done






BIM 360 Administration
Autodesk Model Coordination
Files - Autodesk Docs
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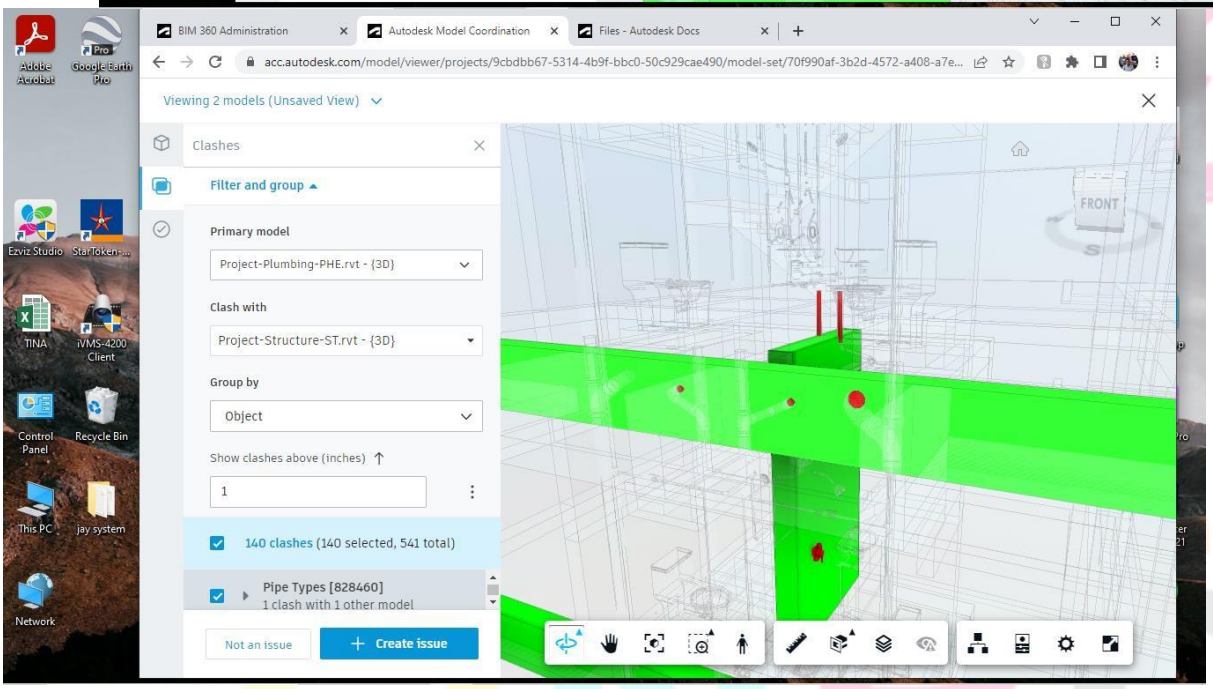
Viewing 2 models (Unsaved View)
Clashes
Filter and group
Primary model
Project-Plumbing-PHE.rvt - {3D}
Clash with
Project-Structure-ST.rvt - {3D}
Group by
Object
Show clashes above (inches)
1
140 clashes (140 selected, 541 total)
Pipe Types [828460]
1 clash with 1 other model
Not an issue
Create issue
FRONT


BIM 360 Administration
Autodesk Model Coordination
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Group by
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Show clashes above (inches)
1
140 clashes (140 selected, 541 total)
Pipe Types [828460]
1 clash with 1 other model
Not an issue
Create issue
FRONT

CHAPTER 4

Future Scope

Scope of BIM Services India has a great effect on the rapid growth of the BIM industry. It seems clear that BIM will shortly supplant Computer-Aided design (CAD). New BIM supporting mobile applications will enable the AEC industry, in general. To maintain a consistent watch on the model, evolving designs and making fast modifications. Resulting in improved interaction with project stakeholders.

BIM has already enjoyed these benefits in developed countries. With the digital depiction of astructure from conception to demolition. BIM process includes planning, analysing, assessing,and programming operational activities. These have also exploded in the AEC business.

BIM executives have a promising future. This is an excellent choice, especially for experiencedworkers. It is because they may grow BIM competency based on their experience rather than their ideas. Such individuals should broaden their knowledge to include all sectors where BIMis essential.

Five ways BIM is influencing the AEC industry's future:

1.Project completion in less time

2.Cost reduction and fewer hazards.

3.Enhanced customer experience and elevated constructions

4.Enhancing long-term viability.

5.A safer turnover of the structure.

CHAPTER 5

Conclusion

In conclusion, Building Information Modeling (BIM) has transformed the construction industry by enabling the creation of detailed digital models of buildings and infrastructure projects. The use of BIM has improved the accuracy of design, facilitated collaboration among stakeholders, reduced errors and rework, and increased efficiency in project delivery. BIM has also enhanced construction management by enabling better cost estimating, scheduling, and resource allocation.

BIM is increasingly becoming a standard practice in construction and is expected to continue to evolve and become more sophisticated with the advancement of technology. The use of BIMis not limited to the design and construction phase, but it also has significant benefits during the operation and maintenance of buildings and

infrastructure assets.

However, the adoption of BIM requires significant investment in technology, training, and resources, and it can be a challenge for smaller firms or those with limited budgets. Additionally, there are still some challenges to overcome, such as interoperability between different software platforms and the need for standardization of BIM processes and workflows.

Despite the challenges, the benefits of BIM are significant, and the construction industry should continue to embrace this technology to improve project outcomes and enhance overall construction management.

CHAPTER 6

REFERENCES

1	Creative Construction Conference 2016, CCC 2016, 25-28 June 2016 A review of Building Information Modelling for construction in developing countries
2	Creative Construction Conference 2016, CCC 2016, 25-28 June 2016 Evaluation of maturity of BIM tools across different softwareplatforms
3	International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-8, Issue-6C2, April 2019 Review of Building Information Modeling (BIM) Application in Construction Industry
4	Building Information Modeling (BIM) for Structural Engineering:A Bibliometric Analysis of the Literature
5	https://bim360resources.autodesk.com/bim-360-customer-success/getting-started-with-bim-360
6	`A Review: Application of Building Information Modelling (BIM) over Building Life Cycles
7	Journal of Engineering Science and Technology Review 2 (1) (2009) 165-169 Scope of Building Information Modeling (BIM) in India
8	Building Information Modeling (BIM) for Structural Engineering: A Bibliometric Analysisof the Literature
9	https://www.autodesk.com/products/bim-360-design/overview
10	https://www.autodesk.com/autodesk-university/article/BIM-360-Design-Collaboration-Everything-You-Need-Know